MINING AND PETROLEUM STANDARD
AND
AMERICAN GAS-LIGHT JOURNAL.

Devoted to Mining, Petroleum, Gas, Water Supply, and Scientific Subjects Generally.

PUBLISHING OFFICE NO. 22 PINE STREET.

VOLUME VIII—No. 9.
WHOLE No. 165.

NEW YORK, FRIDAY, NOVEMBER 2, 1866.

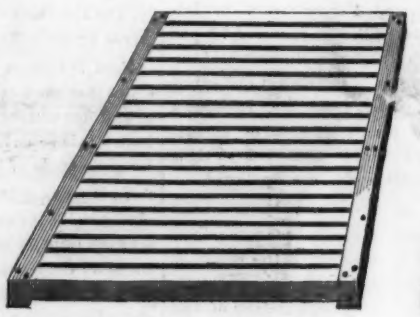
$3 PER ANNUM
IN ADVANCE.

Cheeseman's Solid Wood Trays for Gas Purifiers.

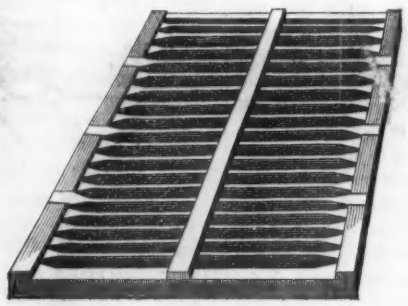
Gas purification is one of the most important operations in the process of manufacturing illuminating gas. Lime is generally employed for this purpose, which is spread in thin layers of two or three inches upon wooden sieves or trays placed in purifiers in tiers one above another with an intervening space. These trays are formed of lattice work or slats, leaving interstices or spaces through which the gas can easily pass and permeate the loosely laid lime, whereby the ammonia and noxious vapors are absorbed, and the gas is rendered less offensive in its odor, and much improved in its illuminating qualities. Iron in various forms has been employed for trays, but the gas soon corrodes and destroys them, and while the first cost is considerable, the frequent replacement necessary makes them too expensive for general use. Wood is generally used, but the integrity or strength of the joinings of the slats and other parts is soon weakened by the action of the gas, and also require frequent renewals.

The Cheeseman Gas Trays, herewith illustrated, overcomes this difficulty effectually by having the slats cut out of solid wood whereby the ends are left complete and continuous. The slats arecut by machinery, and are uniform, so that the slats on the upper side are close together, while the under side is cut out wider so as to give free passage to the gas and prevent the lime from clogging. These trays are strong and durable and are easily handled and cleaned from the lime, and give an increased purifying surface.

CHEESEMAN'S PURIFYING TRAYS.



UPPER SIDE.



UNDER SIDE.

Mr. John L. Cheeseman is the sole proprietor and manufacturer of the Hawxhurst patent, which is the most approved purifying tray at present in use. Orders should be addressed to John L. Cheeseman, 147 Avenue C, New York City.

Steam Car for Street Railroads.

G. P. Clark of Boston, has constructed a street steam car, which is designed to supersede the use of animal power on street railways. Its peculiarities are thus described by the *Post.*:

The car has the appearance of the ordinary horse-car upon the street, differing only in length and in double truck. No part of the engine is visible save the end of the smoke-stack through the top of the car. The great point in relation to the engine is the addition of an exhaust cylinder of the same size and general construction with the motive cylinder. The steam passes from the boiler to the motive cylinder, thence into the exhaust cylinder, in which it is mixed with water and its power greatly destroyed; and from the exhaust cylinder it passes into a water-tank, and there is still further condensed, so far that there is the smallest possible residue to pass into the ash-pit and fire-box. The boiler is connected with the tank, and the water is taken from that into the boiler, so that the same water is used over and over again, with very little waste. The great point gained here is this, there is no escape of steam into the air, and the engine is noiseless in its operations. In addition to this a smoke and gas burner will be used, so that comparatively no smoke will escape from the engine into the street. Again, the attachment of the engine to the truck of the car is novel, compact, and so arranged as to secure the greatest possible force with the least possible occupation of room, just the desideratum for a street car. The whole weight of the engine rests upon the truck and rubber springs, so that the body of the car is not shaken and broken by the weight of the engine. The engine is out of sight under the car, and leaves more room for the engineer than any car of like construction. The fact that there is no escape of steam, of gas, or smoke, that the engine is noiseless in its operations, that it is economically constructed and out of sight, that its weight rests upon the truck rather than upon the body of the car; that the attachments of the engine to the car are so complete, and that the whole car is so compact, powerful, and efficient, conspire to make it the best car and engine constructed for travel on our street railways. This is not all; the same engine and car, and with two or three others attached, which are ordinarily used in the streets of the city, may be run to accomodate railroad travel far more cheaply than the ordinary locomotive engine and car. Steam street cars have been used on the Portland and Kennebec, and also on the Camden and Atlantic road. The great point, however, in Clark's & Robinson's engine is the introduction of the exhaust-cylinder for condensing the steam, a contrivance never before used. It is novel, and engineers are watching the construction and use of this engine with interest, as the same principal may be introduced into all engines used. Some mechanics think that the use of the condensing cylinder may operate to give greater power to the engine, but this remains to be demonstrated. A small engine the first ever constructed, has been for some time at the American House in this city, and has worked to the entire satisfaction of the engineers who have examined it. Though the car is larger than the ordinary horse-car, the truck is so constructed that it will turn easily on the shortest curves in the city of Boston. In this particular, Messrs. Clark & Robinson believe that they have an ease of movement not found in any other car in use. The car is now completed, and will soon be placed upon some one of the city railways for its trial trip.

Electricity from Heat—Convertibility of Force.

If Electricity will afford us light and heat, so heat applied to some metals will give us electricity. Since Seebeck, in 1822, found that an electric current was generated by heating the junction of two dissimilar metals, thermo-electricity was simply a large abstract addition to our knewledge without practical value until Nobili found that the thermo-electric pile, connected with a galvanometer, was a thermometer of wonderful delicacy. But it is now ascertained that its primary value as a source of dynamic electricity, was wholly undeveloped. Our readers are of course aware that the thermo-electric current is due to a *difference* in temperature between the two opposite faces of the elements of the pile. Marcus, of Vienna, was the first to obtain the electric spark. He constructed a powerful thermo-electric battery from an alloy, for the positive metal, of copper, zinc, and nickel; and for the negative, antimony, zinc and bismuth. The elements of this battery were so arranged that their lower junctions could be heated by a row of gas jets, while the upper were cooled by a current of water. The electro motor force of one of these elements was equal to 1-35 of a Bunsen cell. Six of them are sufficient to decompose water rapidly and melt a fine platinum wire. The conversion of heat into electricity was shown by the fact that the water used for cooling the upper junctions of the couples was much more rapidly warmed when the circuit was broken than when closed. More recently Prof. Wheatstone has constructed a battery, composed of sixty elements, connecting the terminals of this battery a brilliant spark was obtained and platinum wire fused. Water was decomposed and electro-plating done. In fact all the effects obtained from a small voltaic combination were reproduced with ease. The electro-motor force of this battery was equal to two of Daniel's cells. These recent experiments seem to show that thermo-electricity is destined to play a far more important part than it has hitherto done. The great constancy of the current, will be one of the chief arguments in its favor. Like windmills, thero-electric batteries might be erected over the country, and entrap—finally converting into mechanical motion, and thus into money—the gleams of sunshine, which would be as wind to the sails of the mill. If this can be so, what a store of power is constantly wasted by the non-use of the solar rays poured on the desert. Can we not utilize this with the thermo-electric battery; can we carry the *force* of Sahara's sun through wires to Cairo, and make them burn in Greenland? The future must answer. Let England not be disheartened by anticipated destitution of heat from the exhaustion of her coal fields.

The Patent Office.—During the past week 384 applications and 68 caveats were received, and 190 patents were issued.

Gas Purification.

For some months past Mr. George Livesey has been testing, on a large scale, at the works of the South Metropolitan Gas Light Company, an important method, for which he has obtained a patent, of desulphurating the ammoniacal liquor, the object being to employ the ammoniacal liquor so purified for the purpose of removing the sulphureted hydrogen from the gas. It has long been known that caustic ammonia has a strong affinity for sulphureted hydrogen, and some years ago Mr. Laming attempted to utilize this fact by taking the foul ammoniacal liquor and passing it into a box containing oxide of iron, allowing it to stand for a short time, and then drawing it off free from sulphur. The liquor thus desulphurated was employed in a scrubber, and so far purified the gas that, on passing the latter through a vessel containing water only, it was found that the sulphureted hydrogen had been completely removed. Expe iments with this process were tried at the South Metropolitan and at the Great Central Gas Works; but although the removal of the sulphureted hydrogen was, we believe, effected, the mode of purifying the ammoniacal liquor by the use of the oxide of iron was an inconvenient one, and the process, therefore, did not come into use.

According to Mr. Livesey's plan, the desulphureting liquor is effected by the aid of a portion of the waste gases taken from the chimney stack, the present method of proceeding at the South Metropolitan works being as follows:—A 5-inch pipe is inserted in the retort flue close to the chimney stack, and through this a portion of the waste gases are drawn away by the aid of an old exhauster, the 5-inch pipe being of such a length that, before the waste gases reach the exhauster they are cooled down. From the exhauster, the waste gases pass into a scrubber, 15 feet 6 inches in diameter and 24 feet high, filled with coke, where they are met by a descending stream of foul ammoniacal liquor distributed at the top in the ordinary manner by a couple of revolving perforated arms, or Barker's mill. The active agent in the desulphurating process is the carbonic acid of the waste gases, which displaces the sulphuretedh ydrogen in combination with the ammonia of the liquor, and thus in place of caustic ammonia a carbonate of ammonia is obtained, which experiments have proved to be quite as effective in absorbing sulphureted hydrogen from the gas as the caustic ammonia. We may mention here that the sulphureted hydrogen set free during the process of desulphureting the liquor is conducted to the smoke stack and burnt, as its escape would otherwise constitute a nuisance in the neighborhood, but it is expected it will eventually be utilized.

The desulphureted ammoniacal liquor obtained from the bottom of the scrubber just mentioned is then pumped up into elevated tanks, from which it is led into other scrubbers, and employed for the purification of the gas. A scrubber of the size above mentioned has been found by experiment to be capable, under favorable circumstances, of desulphureting 640 gallons of foul ammoniacal liquor per hour; the average rate of working is, however, less than this, or about 550 gallons per hour. The quantity of waste gas required to effect the desulphureting of the liquor has not yet been ascertained precisely: but it has been calculated to be approximately about 2,000 cubic feet per hundred gallons purified. The liquor, after being used for effecting the purification of the gas, is again pumped into the foul liquor tank and re-desulphureted, and it can be used over and over again. It is found, however, that the liquor is slightly weakened by the desulphurating process, this weakening arising from the formation of a certain percentage of sulphite of ammonia, which, by the absorption of oxygen, is finally converted into the sulphate.

After numerous experiments, extending over a period of nine months, had been carried out on Mr. Livesey's process at the South Metropolitan works, a trial on the whole make of gas, amounting to 29,000 cubic feet per hour, took place on the 22d of May last On that occasion two scrubbers, of the dimensions already given, were used with desulphurating liquor of barely five oz. strength, the first being supplied with 360 gallons and the second with 340 per hour; and there was also a third scrubber worked with water, this being employed to remove the small proportion of ammonia carried over by the gas from the other scrubbers. The results of trial were that the first scrubbers removed between 70 and 80 per cent of the sulphureted hydrogen and about 20 per cent of the carbonic acid from the gas, and the latter leaving the the third scrubber, it was quite free from both sulphureted hydrogen and ammonia, and had given up half of its carbonic acid. The experiment was continued as long as the supply of the desulphureted liquor lasted.

On the 31st of May a more extended trial was commenced, this continuing until the 30th of June, and the make of gas during that time being 18,300,000 cubic feet per day. During this series of experiments one scrubber was used for effecting the desulphurating of the liquors, so as to keep up the supply, and the gas was acted upon by two scrubbers, one worked with the purified liquor and the other with water, the gas after leaving the scrubbers being conducted to the ordinary oxide purifiers as usual. Before the experiments were commenced, the oxide purifiers were "going off" or becoming foul at the rate of about once per week; but after the gas was subjected to the action of the desulphurated liquor only one purifier "went off" during the trial, and that not until the end of June. On the 31st of May box No. 2 stained the lead paper, it was not until June 30th that No. 3 did the same, and this notwithstanding that the "liquor process" was stopped one day through a leaky valve, and on another through the pump getting out of order in the night, making a period of quite twelve hours during which the gas went direct to the oxide purifiers. The single scrubbers worked with the desulphureted liquor was supplied with about 400 gallons of the latter per hour, and it was found that it removed 75 per cent. of the sulphureted hydrogen and about half the carbonic acid. The bisulphide of the carbon and other sulphur compounds were found by Mr. Letheby's test, on an average taken from a number of experiments, to be reduced to 36 per cent below their amount when the purified liquor was not employed.

At present the plant at the South Metropolitan works does not allow of the process above described being applied to effect the purification of the whole of the gas made; but Mr. Livesey is, however, now erecting two large scrubbers for the desulphurating of the liquor, and is making other preparations for applying the process more completely. We should state, however, that, even when the new apparatus is completed, and the liquor system of purifying in full action, Mr. Livesey does not contemplate the entire disuse of the oxide of iron purifiers, but intends always to pass the gas through one or two boxes containing the oxide, so that in case of any accidents hapening to the scrubbers the oxide would come into action and prevent foul gas from being sent out. The scrubbers for desulphurating the foul liquor are being built of brick, and they will each be 17 feet 6 inches in diameter inside and 20 feet high. Beneath them are large tanks, the one capable of holding 18,000 and the other 30,000 gallons of liquor.

When the new brick scrubbers are completed, the three scrubbers, 15 feet 6 inches in diameter and 24 feet high, which are now used both for desulphurating the liquor and purifying the gas, will be required for the latter purpose only, and a fourth scrubber of the same dimensions, which is now being completed, will shortly be available for the same purpose. Under the new arrangements the waste gases will be led from the flue through a 12-inch main instead of by a 5-inch pipe, as at present, and it is probable that a condenser of the kind ordinarily used will be placed on the line of the main, so as to effect more thoroughly the cooling of the gases before they reach the exhauster.

At first the liquor was delivered by the pumps directly to the scrubbers; but now an elevated tank has been erected into which the pumps deliver, and from which the supply for the scrubbers is drawn. The tank is divided into four divisions, one being for the foul liquor which is to be desulphureted, and the other three being intended for the reception of the purified liquor to be supplied to the scrubbers in which the gas is purified. It was supposed at first that there might be some deposition of tar in the pipes leading from these tanks or divisions, and the pipes were therefore led into another similarly divided tank sunk in the ground, other pipes leading from the division of this tank to the scrubbers. The sunk tank was intended to receive any tar which might drain down; but it has proved to be quite unnecessary, and has indeed, occasioned some trouble from leakage taking place through the divisions separating the compartments.—*Mechanics' Magazine.*

Practical Receipts.

Covering Zinc with Brass or Copper.—To give zinc a coat of copper or brass for the purpose of subsequent silvering or gilding, the following solutions are used: For copper alone, a solution of sulphate of copper, saturated at the common temperature, is mixed with a solution of cyanide of potassium, adding as much of the latter as is necessary to dissolve the precipitate thrown down at first—The hydrocyanic acid disengaged during this operation must be carried off by a draft or flue.

When the mixture is clear, one-tenth or one-fifth of its volume of liquor ammonia is added, and diluted with water to a density 8° Baume. For brass, blue and white vitiol are used in equal proportions, and prepared as before. Two parts of sulphate of zinc and one of sulphate of copper give a bright brass coating. Previous to their dipping, the articles of zinc are rubbed thoroughly with finely-powdered pumice-stone and rinsed with water, after which they are again rinsed in water and wiped off. The copper or brass coating has a very bright look, as if polished, and adheres perfectly. The thickness of the coat may be increased afterwards by the aid of a battery.

Fine Polishing Powder.—Prof. Vogel, of England, states that the finest powder for polishing optical glasses and fine metals, is made by calcining the oxalate of iron. It is superior to the common polishing powder for glass made of lixiviated colcochar.

To Remove Silver Stains—In the *Photographischer Archiven*, M. Obernetter recommends a concentrated solution of perchloride of iron as a detergent for silver stains on the hands or cloths. If gallic or pyro-gallic acid has been used, it will be necessary to wash the spot afterwards with a few drops of a strong solution of oxalic acid. A weak solution of this salt is also useful for diminishing the intensity of negatives to be copied in the solar camera. Weak negatives may be transformed into strong ones by using first a solution of chlorid of iron, and secondly wih pyro-gallic acid and nitrate of silver.

Magnets.—To make a cast-iron magnet, take a smooth bar of cast-iron, place the middle of it to the north pole of a magnet and draw it to the end, repeating the stroke always from the middle to the end, and rubbing in the same way each time. Then place the middle of the bar to the south pole of the magnet and rub towards the opposite end of the bar, repeating as before. Magnets can be made in this way of steel as well as of cast iron, and may be in the form of a horse-shoe or star as well as a straight bar.

A Substitute for the Lime in the Drummond Light.—A piece of the chloride of magnesia is placed upon a support of retort carbon in the oxyhydrogen flame. The chloride decomposes and leaves a spongy oxyde, which is raised to incandescence and gives a very brilliant light, which is equal to the lime light in brilliancy and exceeds it in actinic power.

An Inch of Rain.—An inch deep of rain on an acre yields 6,272,640 cubic inches of water, which at 277,-574 cubic inches to the gallon, makes 22,622-4 gallons. A gallon of distilled water weighs 10 pounds. The rain-fall on an acre is 226,225 pounds avordupoise 2,240 pounds are a ton, and consequently an inch deep of rain weighs 109,933 tons, or nearly 110 tons per acre.

Foreign Scientific Items.

Translated for this Journal by

PROF. HENRY WURTZ.

VII. Carbolic Acid as an Anti-Epizootic Agent.—The recent highly valuable investigations of Crookes upon the preventive and cureative power of this tar-product in the cattle disease, have led in France to the consideration of its possible applicability to other epizootics; and more particularly to that terrible malady which has recently impoverished and well-nigh ruined an important industry of that country, namely, the *silk worm disease;* a disease admitted to be due to a parasite, whose germs travel through the air.

Béchamp and others, who have experimented on the subject, have communicated their results to the Academy of Sciences. They find that *creosote*, the preparation with which they operated, when introduced into the atmosphere—while it prevents wholly the germination of the parasites—does not retard that of the silk-worm eggs. In such a medium, also, the worm lives and thrives, spins its cocoon, and passes through the chrysalis form inio the moth. The moths also live and copulate, and the females lay their eggs in such an atmosphere. The *Journal de l' Eclairage* suggests very pertinently that instead of the uncertain and impure minture called creosote, the pure carbolic acid, now to be obtained as an article of commerce, should be made use of; and that the silk-worm eggs, after having been engendered in an atmosphere containing this agent, should be at once packed for preservation between layers of cotton to prevent any access of parasitic germs from the atmosphere.

The attention of the agricultural class, and of the public generally, cannot be too strongly called to the importance of the experimental determination of facts regarding the now well-known powers of carbolic acid, in preventing and arresting the development of all the great destructive agencies which appear to pervade nature, and to lie in wait constantly for all organized bodies. Not only does this extraordinary compound appear to arrest the natural putrifaction or eremacausis of dead organisms, but also to have power over those mysterious changes (whether they be of the nature of "fermentations," or due to those low forms of vegetable and animal life called parasitic) which constitute and give rise to morbid conditions of living organisms. The prospect seems very good that by its means we may be able to combat, and mitigate at least, many destructive diseases of both domestic animals and plants.

VIII. Employment of Water from Coal Mines in Steam Boilers.—Victor Stoclet, a French engineer, has observed some curious and important facts under this head. There was observed, on using in locomotives the waters from certain colleries—at Gilly, Charleroi, and elsewhere—that when the pressure reached 6 or 7 atmospheres, a curious phenomenon appeared. The water diffused itself throughout the steam, and issued from the boiler in the form of spray: the feed pumps becoming insufficient, so that after running a short distance it was found necessary to extinguish the fires. Stoclet found this effect to be owing to the presence of fatty or oily substance, which at the temperature corresponding at from 5 to 9 atmospheres, causes the liquid to "boil up," in a manner so similar to that so familiarly observed in the case of *milk*. He found also that this oily substance was a product from the minute particles of coal held in suspension in the water, under the influence of heat and pressure. Stoclet points out, with reason, that some of the principal modes of purification that have been devised, can be efficient in such cases as this; and that the accidents and explosions that may arise from this form of frothing can only be entirely prevented by a complete mechanical separation of the coaly matter by settling or filtration, the latter being preferable.

Of course it is only waters from mines of bituminous coal which are subject to this drawback.

IX. Leaden Water Pipes.—The patience and apathy with which the people of this country endure, and even ignore, great public abuses, has no stronger exemplification than in the case of the persistent and obstinate adherence to the use of poisonous conduits for the chief necessarier of life If not implying actual corruption on the part of great corporations and municipal bodies, it certainly argues a degree of indifference to the health of the community which is highly culpable.

Under the actual circumstances, all suggestions looking to a mitigation of the danger deserves careful consideration. Some months since, Dr. Schwarz, of Breslau, proposed to coat the internal surfaces of the leaden pipes with films of *sulphid of lead*, by filling them with a warm concentrated solution of an alkaline sulphid. It was argued from the known extreme insolubility of sulphid of lead; also from the fact that the waters which flow from mines of galena contain no lead in solution; also from the alleged fact that *distilled water* long digested in a pipe so prepared takes up no lead; etc., etc.; that all danger is thus obviated. It remaies yet to be determined, however, how far these hopes will be justified.. It seems inevitable that Schwarz's sulphid would soon be converted, by the dissolved oxygen of the water, into sulphate of lead; and it has been long known that natural waters which contoin sulphates quickly produce such a resistant film of sulphate of lead upon the inner walls of the pipe. It would appear, therefore, an improvement upon Schwartz's idea to coat with sulphate at once, by using, for instance, a mixture of dilute sulphuric acid with a little saltpetre or chlorate of potash. It is also well known, however, that the action of dissolved oxygen and sulphates is liable to go on, and the coating to accumulate, until a slight tap or jar given to the pipe will cause the emitted water to become milky with sulphate of lead, a compound no doubt sufficiently soluble in the acids of the gastric juice to be far from harmless. The known solvent action of alkaline waters and of chlorids of sulphate of lead is also important in this connection. In short, the use of lead for water-pipes should be as thoroughly eschewed and avoided, when possible, by all prudent persons, as that of copper in cooking utensils, or gamboge in confectionary.

To be continued.

Interesting Statistics of the United States.

The following interesting item of statistics was prepared in the United States Census Bureau, Department of the Interior, and taken from a report in reference to the area, population and density of population of the United States:

The land and water surface of the United States are equal to 3,250,000 square miles—land 3,010,370; water about 540,000 spuare miles. The States embrace 1,804,351 square miles of landed surface and the Territories 1,206,019 miles, as exhibited by the eighth census of 1860. The number of inhabitants in the United States returned in 1860 was 31,443,321—in the States 31,148,046, and 295,275, in the Territories—Thus showing an average of seventeen inhabitants to each square mile in the States while in the Territories there are four square miles to each inhabitant, and exclusive of the District of Columbia the territorial area would represent one and one-fifth square miles to each inhabitant. In 1860 Massachusetts had 157, Rhode Island 133, New-York 82, and Pennsylvania 62, inhabitants to the square mile, which rate applied to the United States, would give 472,000,000 in Massachusett, 400,000,000 in Rhode Island, 245,000,000 in New York, 189,000,000 in Pennsylvania. Belgium, and England and Wales and France in 1855 had 397, 307, and 176 inhabitants to the square mile respectively. If the United States was as densely populated as France, our population would number 528,000,000, or if populated as densley as England and Wales 924,000,000, and if according to Belgium's density of population (397 to the square mile) the United States would contain 1,195,000,000 which is 110,086,000 more than the entire population of the world in 1866.

—The population of San Francisco in 1860, was less than 60,000. It is now 120,000. It rates as the fourth in the amount of customs paid. The value of her manufactures is $20,000,000 per annum.

The Process of Roasting Ores.

Translated from the German of F. Plattner, for the Mining & Petroleum Standard and Am. Gas-Light Journal, by

J. H. TIEMANN.

NUMBER IV.

When, on the contrary, the heat comes from the hearth of the furnace, it often happens that the ore sinters, (cakes) in which condition it adheres as firmly to the hearth as if it had been smelted. Although this may be overcome to a certian extent by constant stirring with the roasting-rake and scraper, there is still another disadvantage viz: that the heated under portions of the ore upon coming to the surface are too much cooled by the cold air, in consequence of which the oxidation of the sulphur metals and the roasting is very irregular, and a quantity of large and small lumps are formed, which latter often contain large quantities of undecomposed ore. It is thus shown, that for such ores or products as are inclined to sinter (cake) in roasting, an ordinary reverberatory furnace is better adapted than a muffel furnace, and that a constant stirring of the ore with the roasting-rake, especially in the first part of the process when the oxidation is the liveliest, is absolutely necessary.

On the other hand, when the ores or products to be roasted consist of such sulphur or arsenic metals which do not easily incline to sinter, a muffel furnace may be used as well as a reverberatory, when in the former the requisite amount of heat can be produced Neither is it necessary (except in certain cases which will be noticed hereafter) that the substance to be roasted, should be so constantly stirred as those which sinter easily; in fact, it would be wrong to do so with sulphur metals which roast at a high temperature, as for instance Zinkblend, because the oxidation having been commenced might be thus easily retarded, especially where the substance is roasted in a muffel furnace. A particular method for each different case is not possible, for here, as in most other processes practice is the best teacher.

II Practical examples of the formation of Sulphates, Arsenates, Antimonates and free oxides, in the roasting of Sulphur metals or Sulpharsenic and Arsenic metals.

A few examples taken from practical tests will serve to show more distinctly, that ores or mill-products consisting of sulphur metals or sulpharsenic with arsenic metals, when roasted either in large quantities in a reverberatory furnace with a horizontal hearth, built in accordance with the foregoing principals, or in smaller quantities on a clay dish in a muffel, with a proper addition of atmospheric air, and at the lowest possible temperature, always show an inclination, according to their chemical composition, to change to sulphates, arsenates or antimonates, and the resulting sulphates, upon an increase of temperature, are more or less decomposed, and in the same ratio, change to free oxides.

A. Examples of the deportment of different ores and mill-products, when roasted in a pulverized form in a reverbatory furnace, or in small quantities in a muffel.

1. Schwefelkies (Iron Pyrities) when pulverized and exposed to a temperature sufficient to ignite sulphur and the requisite amount of air is admitted, soon begins to glow and in some places burns with a flame, the glow soon spreads throughout the entire mass, and in consequence of the oxidation of the sulphur and iron, sufficient heat is generated at those points where the air with all its oxygen comes in contact with the ore to drive off nearly the half of the sulphur from those parts with which it does not come in direct contact.

If the glowing mass of ore be stirred, so that gradually all the different parts come in contact with the air, an increase of temperature is apparent, and in consequence of the generation of gas and steam, and a general change in the whole mass, an increase of the volume—it becomes "wooly"—so that, if the roasting has been carried on in a reverberatory furnace, it flies in every direction from the rake or whatever instrument be used for stirring, no matter how slowly or carefully the instrument is moved. The sulphur of those parts of the pyrities with which the air comes in direct con-

tact, burns quickly to sulphurous acid which passes off as a gas, while the sulphur which is driven off by the heat generated by the oxidation, either burns in like manner to sulphurous acid when the heat is sufficient and there is no lack of atmospheric air, or when the heat is not sufficient, it escapes partly in the form of vapor. In the same ratio as the oxidation of the iron and sulphur approaches completion, the temperature and the wooly appearance of the ore decrease, so that finally the red glow disappears, and the roasted ore if not heated by fuel, appears almost black, but when entirely cool assumes a light red color. The product of such a roasting consists of free oxyd of iron, and a small amount of basic sulphate; very often but 0·4 to 0·5 per cent. of sulphuric acid is found in it, which if we think of it in combination with the oxyd, would give 1-3 to 1-6 per cent. of simple sulphate of iron. If the mass be again heated to a glow with fuel, it swells again, becomes wooly, and as the oxyd of iron is a weak base for sulphuric acid, it changes almost entirely to free oxyd, the sulphuric acid going off as a vapor. If the heating be effected by means of a flammable fuel which carries soot or unignited reducing gases to the glowing oxyd, a part of the latter is changed to a combination of sesquioxyd with protoxyd, which after cooling is almost black and is attracted by the magnet. The quantity of this compound is the greater, the less the amount of air admitted to the roasting chamber between the flame and the already formed oxyd.

2. Magnetkies (Magnetic Pyrities) $_6Fe\,S, Fe\,S^2$ or or $_5Fe\,S, Fe^2S^3$ When exposed in a powder, and by admission of atmospheric air, to a dark red heat, glows gradually, evolves sulphurous acid, and changes, especially when constantly stirred, to a spongy sesquioxyd of iron, which on cooling has a red color but contains a little sulphate and persulphate. If this red product is heated further to a bright red heat, the protoxyd is oxidized at the expense of the sulphuric acid, to sesquioxyd, and free sesquioxyd and sulphate is formed, while sulphurous acid passes off, the sulphate forms now but a small percentage of the mass, and if the roasting be continued, decomposes almost entirely to free sesquioxyd and sulphuric acid. If the under layer of the gaseous products of combustion was free from unignited and consequently reducing particles, the product on cooling resumes its red color, otherwise it retains more or less of its dark color and as it contains sesquioxyd, is attracted by the magnet.

* *Note*—Should any one desire to convince himself of the amount of heat generated by the oxidation of an easily oxidizable metal, it is only necessary to take metallic antimony or arsenic. If a piece of the former of the size of a pea be heated on charcoal before the blowpipe till it smelts and the heat continued till the fluid metal is red hot and gives off fumes and the heating be then discontinued, the metal continues for a long time in a fluid state evolving thick white fumes, which at first settle on the coal finally on the metal globule, in mother of pearl colored needles. Which is thus explained: the fluid metal absorbs oxygen from the air forming an oxyd of antimony, generating thereby sufficient heat to retain the easily fusible metal in a state of fusion, which continues till the globule has been completely surrounded by the oxyd. Metallic arsenic when heated in the same way, changes to arsenious acid.

Concrete Foundation.—A somewhat novel application of concrete as a foundation has been recently made at the Straits Bonifacio, between Corsica and Sardinia. At the entrance of the straits is situated a dangerous sunken rock, known as the "Monachi" upon which it is intended to erect a light-house. The surface of the rock is about 7 feet below the water-line. A large coffer-dam about 20 feet square was made, and having been floated into position, was secured to the rock by iron bolts. The coffer-dam was then filled with concrete, and the dangerous rock is now surmounted by a massive foundation above the level of the highest tides. The light-house is intended to replace a bell-buoy which was placed on the rock after the disastrous wreck of the *Semillante*.—*Builder*.

Applied Science.

Extracts from the proceedings of the American Institute.

Mispickel.—Dr. Feuchtwanger, on exhibiting to the Association specimens of this mineral, an arsenio-sulphate of iron, stated there were numerous veins of it in this country all of which remained unworked, while we are importing not less than 100 tons of arsenic per annum.

Mercury as a Conductor of Heat.—M. Grisson has reported to the French Academy of Science, the results of his experiments. If the heat-conducting power of silver be taken at 100, that of mercury is only 3.54, or about one twenty-eigth of the power of silver. Mercury conducts heat more slowly than any other metal and but little faster than marble.

Relation of Atomic Weights to Volatility.—Recent experiments by Bunsen in volatizing the chlorides, chromides and iodides of the alkaline metals have led him to some interesting deductions. The degree of volatility of any one of these compounds divided by its atomic weight gave, in all cases, nearly the same quotient, from which it may be inferred that their volatility decreased inversely with their atomic weights.

Petroleum Products.—Prof. Vanderweyde of Philadelphia made a very complete display of all the compounds into which petroleum is separated by distillation. The lightest product exhibited was a vapor at ordinary temperatures, but by slight pressure was reduced to a liquid, a bottle of which was shown. The speaker proposed to use it, as Rhigoline has been used by Dr. Bigelow of Boston, for local anæsthesia. All that is required is to loosen the cork, and allow a little of the liquid to escape on that part of the body to be chilled, the immense amount of heat absorbed on assuming the gaseous form being thus abstracted from the part in contact with it; but more care must be taken than with that distilled by a little higher heat which is liquid at ordinary temperatures.

That product known as *gasoline*, lighter than kerosene, is burned in a lamp fitted for that purpose, which is filled with saw dust. The fluid is then poured into the inverted lamp through an aperture in the bottom. It has no wick, but in place of it a tube perforated with four or six very small holes. On exposing the tube to the flame of a match, enough heat is obtained to generate the gas, which on issuing from the tube takes fire and gives a very brilliant light. The tube thus heated by the flame continues to generate the required gas. This lamp as well as the can by which it is filled, has its large apertures covered with wire gauze, similar to that used in Sir Humphrey Davy's safety lamp, to prevent the flame from reaching the interior.

The products of some petroleum wells contain nitrogenous matter, from which the beautiful aniline colors are made. These were exhibited; also parafine, which has lately been used for making ordinary thin wrapping paper impervious to air and moisture.

Several other petroleum hydro-carbons used in the arts were shown, but the speaker devoted most time to setting forth the advantages derived from the body used as a lubricator. In conclusion he answered many questions asked regarding lubricators now in common use, after which a very spicy discussion followed on this subject, in which Dr. D. D. Parmelee, Dr. J. B. Rich, Messrs. Hersh, Overton, Walling and others participated. A unanimous vote of thanks was tendered to Prof. Vanderweyde for his able exposition of the results of Petroleum Distillation after which the Association adjourned to Thursday evening October 18.

Crushing and Stamping Superseded.

As a substitute for crushing and grinding, Messrs. Baume & Mapps propose to submit the quartz to a purely chemical treatment, and with regard to the result it will suffice to state that a piece of quartz that could with difficulty be broken was rendered as soft as well-burned lime in five minutes. The cleavage on the rock was perfectly destroyed, and every particle, to all appearance, set free. In a word, the disintegration was perfect. The great advantage to be gained by this process is its cheapness. We are assured by Mr. De la Baume that the necessary chemicals will not exceed $1 per ton. The plan is to roast the ore in a perpetual furnace, after which it is subjected to a chemical bath which completely disintegrates the rocks. In the composition of this bath consists the invention. If successful, its advantages will not alone be felt in the saving of the cost in reducing ores, but also in more effectually extracting the metals from the ore. It is well known how large a proportion of the metal is lost from the rock being imperfectly crushed. It is true that the particles of rock when reduced to sand are still capable of infinite division, but in the stamp process this work is more or less imperfectly done, and the particles of gold and silver are carried away in the particles of rock that do not become sufficiently reduced to set the metal free. This new process promises to set the metal free at once, there being little grinding necessary, more than to properly amalgamate the metals with the quicksilver. More than this, it would seem from the imperfect experiment we saw that there must be a great gain in the work of amalgamating—the rock being rendered so soft that a few turns of the arasta or the pan, will be sufficient to reduce it to a pulp. Mr. De la Baume has been experimenting three years to find this process, and now, by the help of Mr. Mapps, he flatters himself that it is obtained.

Petroleum in Italy.

At the British Association Prof. Ansted submitted a paper on "Intermittent Discharges of Petroleum and large deposits of Bitumen in the valley of Pescara, Italy." The valley of the Pescara runs up from the town on the Adriatic coast to a narrow and important gorge of the Appenines. Close to the gorge, 35 miles from the sea, is the town of Tocco. The rocks near are limestones, overlying chalks. The limestones are much broken, but more or less nearly horizontal. The shales are below them, and nearly vertical. The limestones are cavernous, and bitumen exudes freely in summer from the exposed faces wherever there are cracks. Springs of water issue in abundance during part of the year. Height above sea, 2750 ft. A couple of miles from the valley to the south there are water courses, down which water rushes after rain. There are many swallow holes into which water enters. From openings in the rock below large bodies of water sometimes issue. From one of these, when rain has fallen, the water comes out mixed with much petroleum, at a level of 1000 ft. This has been collected, and is of some value. The quantity collected has amounted to 15,000 gallons in the course of some days of the month after the first rains(November). Of this perhaps 10,000 gals. would be petroleum, and the rest water—not salt. By drawing water into shallow holes above, at 1480 ft. and 1230 ft., the petroleum and water can be obtained artificially. Prof. Ansted saw, when he visited the spot, about 1500 gallons collected in two days; say, 1000 gallons of available petroleum, yielding valuable light and heavy oils, and asphalte on distillation. At Letto, about half-way between Tocco and the coast, and in an area five miles radius round Letto, are enormous deposits of bitumen and much sulphur. At Letto itself there is a vast gorge close to the town opening into a valley 300 ft. below the gapway, 50 yards wide and filled up with little else than earthy and some very pure varieties of black and brown bitumen. This gorge is nearly east and west, and the vein or dyke of bitumen inclines to the north. The author traced it 800 yards up the gorge, and at least as far down towards the valley below. The whole of the way there was nothing but bitumen and limestone fragments formed into a brocia with bitumen. On the north wall of the dyke was an enormous deposit of native sulphur in crystals. Half a mile south of the principal dyke is another where the author observed 20 ft. of solid bitumen. Two miles away from the town to the north-east he noticed another gorge, not so large as that at Letto, but yielding a large quantity of excellent bitumen. On careful distillation by Mr. Dugald Campbell, the bitumen yielded on an average, 55 gallons to the ton, of which on re-dis-

tillation 17 gallons was light burning oil, and rather more heavy than lubricating oils. Though well known and used, this spring does not seem to have been affected by the eruption. Except at Pyrmont, I have never seen water so charged with gas. A short distance beyond this spring is another of sub-acid water issuing from beneath old lava, at a temperature of 60° Fahrenheit. About a mile from the mud volcano, and in the direction opposite the springs, are blocks of very tough basaltic lava, on a natural slope. They had apparently fallen from a basaltic cliff abave. These blocks when struck with a hammer, give out a strong bituminous odour, and when a fragment is broken off innumerable small cavities full of naptha may be observed on examining the broken surface. According to Professor Sylvestri, of Catania, the muddy water at a temperature of 16° Centigrade was of the specific gravity 1-1469 and gave an alkaline reaction. The marly matter suspended in the water was 15-63 per cent. of the whole. When filtered the specific gravity of the water was 1 303; taste, very salt and slightly bitter. It contained 84 per cent. of soluble salts, including bicarbonates, ulphates, phosphates, nitrates, (trace), chlorides, bromes, iodines, and fluorides. The bases included sodium, tassium, cæsium, rubidium, calcium. magnesium, aluminium, lithium, and iron. As much as 6 per cent. onsisted of chloride of sodium. The gas contained in e water was almost entirely carbonic acid gas, with small quantity of oxygen and nitrogen. Professor stad, after giving an analysis of the erupted gases, ed some further interesting personal details relative o his visit to the district named.

Correspondence.

Oil in the West.

TERRE HAUTE, Oct. 17th, 1866.

MESSRS. EDITORS,—Struck oil at last. You have doubtless heard it before this—but I would not write until I was certain that it was a permanent reality. Mr. Rose, in boring his artesian well, in hopes of getting soft water, at the distance of 1,312 feet, struck oil. It commenced flowing out over the ground, when operations were stopped until orders were received from Mr. R. (he being East) in reference to it; he at once determined on tubing it. The necessary tubing was obtained and inserted, when the well commenced flowing. It run for about 1½ minutes the full of a 2 inch pipe, at intervals of about five minutes; during the intervals gas was discharged from the pipe. This afternoon the the pump was attached and successfully worked throwing a solid stream of 2-inch diameter almost continually. Two barrels have been sent by Mr. Rose to the refiners in Cincinnati, to test its quality, specific gravity, &c. Mr. Rose told me this afternoon, that it was pronounced of better quality than the Pennsylvania oil! About twenty barrels of it were filled on the ground this afternoon, and when I was there they were putting in a second (1-inch) spigot to draw off with from the tank.

Mr. Town sent three vials by express to New York to have a chemical analysis of it by some of your chemists. You will soon see our beautiful prairie city announced as the "Oil City of the West."

The town is under great excitement—all our solid men were at the mill this afternoon. It is very dark in color and seems to have considerable body. I am in hopes it will prove a success, as it will materially help the growth of our city.

As it is right on the prairie, there is no reason why it should not be found, on boring the same distance, at almost any other point.

The well, up to the time it struck oil, cost Mr. Rose $12,000; so you have the figures to work on.

Yours truly, G. R.

Shall I put a Pump in my Well?

If the earth stratum, from the bottom of the well to a point as high as the water ordinarily rises, is either solid rock, or what is commonly called hard pan, so that there is not a free ingress and egress of water, the warmth of summer air keeps the upper portion heated, and consequently expanded and specifically higher, than the lower, colder portion.

In that case, if the water is drawn from the bottom of the well, by what is called a suction pump, or by a forcing pump, there is none removed from the upper portion, and this soon becomes putrid and offensive.

In a well of that kind, a bucket should be used, which will take the water more from the upper surface, and mix the upper portion with the lower. The same, or better result, is obtained by the use of the chain pump, which mixes the water at each time of drawing.

If the stratum occupied by the water, is loose, coarse gravel, the water generally flows in at one side of the well, and out at the opposite, and does not become stagnant and putrid, whether water is drawn by bucket, or by pump of any ordinary material, or construction, or not drawn at all, or whether the well is closely covered or not. D. C.

Result of Working Tests

OF PROFESSOR WURTZ'S SODIUM-AMALGAM DISCOVERY, IN NOVA SCOTIA.

The following extract of a letter from a correspondent in Nova Scotia, may interest some of our readers:—"The experiments which I carried out with Dr. K., at the Lake Major Gold Mines, proved so satisfactory that Dr. K. was induced to operate upon a quantity of pyrites, which has hitherto been accumulating in enormous quantities about the works, as you are aware. This morning he informed me that he has, by the sodium process, and in a very simple and inexpensive way, obtained gold from the pyrites in the proportion of *five ounces per ton*. This result far exceeds his most sanguine expectations. He is desirous of making arrangements for having large quantities of amalgam, and would like to know what it would cost in quantities of a ton."—*Chemical News, August* 31, 1866.

THE MINING & PETROLEUM STANDARD AND AMERICAN GAS-LIGHT JOURNAL, is published at No. 22 Pine Street, opposite the Sub-Treasury Building on the 2d and 16th of every month, and is a recognized official organ of—

LIGHT, HEAT, MINING INTERESTS.

PETROLEUM, WATER-SUPPLY, AND

SCIENTIFIC SUBJECTS GENERALLY.

TERMS.

SUBSCRIPTION—Three dollars per annum in advance.

ADVERTISEMENTS.—One dollar per inch in column for each insertion. Large space or long time by special contract.—Payable in advance.

AGENTS.

BOSTON—S. M. PETTENGILL & Co., No. 6 State Street.
PHILADELPHIA—JOY, COE & Co., No. 441 Chestnut st. cor. 5th.
Germany ... ...B. WESTERMAN & Co., of New York.
Great Britain....TRUBNER & Co., 60 Paternoster Row, London.
France.....LE JOURNAL DE L'ECLAIRAGE AU GAZ, 25 Boulevard Poissonnière.
Brussels, Belgium—HENRI BERGE.

☞ All communications to be addressed to "The Editors," No. 22 Pine Street, New York.

SUBSCRIBERS would confer a favor upon us by remitting CHECKS or POST OFFICE MONEY ORDERS, as we are frequent losers where money is enclosed in letters.

CATALOGUE of Scientific, Military, Naval and Miscellaneous BOOKS just published, and sent free on application.

D. VAN NOSTRAND,
PUBLISHER,
163 192 Broadway, New York.

MAYNARD & TIEMANN,
Mining Engineers & Metallurgists
240 PEARL ST., NEW YORK,
—AND—
CENTRAL CITY, COLORADO.
G. W. MAYNARD. J. H. TIEMANN.

WILLIAM TAYLOR & SONS,
COLUMBIAN IRON WORKS,
Nos. 11, 13 & 15 Adams Street, Brooklyn, N. Y.
MANUFACTURERS OF ALL KINDS OF
Castings, Iron Buildings Store Fronts, Columns, Girders and Beams.
Steam Engines, Mill Gearing, Hydraulic Presses for the manufacture of Linseed and Cotton Seed Oils, Sugar Mills, Single and Double Action Pumps, also Steam Pumps, Coal Oil Machinery, High and Low Pressure Boilers, Tacks, Kettles, Soap Curbs, &c.,
MADE AND REPAIRED AT THE SHORTEST NOTICE.
WM. TAYLOR. JAMES A. TAYLOR. EDWIN S. TAYLOR.

CASTINGS FOR GAS WORKS FOR SALE.
ONE COMPLETE SET HYDRAULIC MAINS for a bench of seven ovens, including Dip, Bridge, and Stand-pipes and Mouth-pieces for ovens of three retorts. Also, a COMPENSATOR, complete, and one EXHAUSTER, in perfect order, equal to passing Two Hundred and Fifty to Three Hundred Thousand feet of Gas per day. The whole, or separately, for sale low.
Apply at the Office of the
160-tf ALBANY GAS LIGHT COMPANY.

School of Mines, Columbia College.
EAST 49th-ST., NEW YORK.
FACULTY:
F. A. BARNARD, S. T. D., LL. D., President.
T. EGGLESTON, Jr., E. M., Mineralogy and Metallurgy.
FRANCIS L. VINTON, E. M., Mining Engineering.
C. F. CHANDLER, Ph. D., Analytical and Applied Chemistry.
JOHN TORRY, M. D., LL. D., Botany.
CHARLES A. JOY, Ph. D., General Chemistry.
WILLIAM G. PECK, LL. D., Mining, Surveying and Mechanics.
JOHN H. VAN AMRING, A. M., Mathematics.
OGDEN N. ROOD, A. M., Physics.
J. S. NEWBERRY, M. D., Geology and Palæontology.
The plan of this School embraces a three-years' course for the degree of ENGINEER OF MINES, or BACHELOR OF PHILOSOPHY.
For admission, candidates for a degree must pass an examination in Arithmetic, Algebra, Geometry and Plain Trigonometry. Persons not candidates for degrees are admitted without examination, and may pursue any or all of the subjects taught. The next session begins October 1, 1866. The examination for admission will be held on September 28, 29. For further information and for catalogues, apply to
62-65* PROF. C. F. CHANDLER, Dean of the Faculty.

GAS-METER GLYCERIN.
WE SOLICIT THE ATTENTION OF GAS COMPANIES to our GLYCERIN, which is now generally known, and is undoubtedly the best article ever used for filling Gas meters. Glycerin of 15° Beaume will stand 14° below zero without freezing, and the greater the density the lower the temperature it will stand.
We have sold to most of the large companies throughout the country, and annex a few certificates showing its value:

OFFICE OF THE CINCINNATI GAS-LIGHT & COKE CO., CINCINNATI, OHIO, Nov. 25, 1865.
I take pleasure in stating that the glycerin furnished by W. J. M. Gordon & Bro, of Cincinnati, has been used in wet meters by this Company during the past two years, and has proved very satisfactory thus far. Having resisted the action of frost, and not evaporated more than about six per cent. each year.
The standard for density being 15° Baume's scale.
H. I. MILLER, President.

OFFICE GAS-LIGHT CO., BALTIMORE, Dec. 16, 1864.
MESSRS. W. J. M. GORDON & BRO.—Of the numerous fluids used by this Company in their gas-meters to prevent freezing, none have given the satisfaction of the Glycerin manufactured for that purpose by the Messrs. Gordon & Bro, of Cincinnati, Ohio. As Glycerin will withstand a temperature below anything in the latitude of Baltimore without congealing, and as it does not evaporate like the alcoholic mixtures, once filling a meter will last for years. Yours respectfully,
J. MORTON SAUNDERS, Engineer.
COLUMBUS O'DONNELL, President.

Glycerin for Printers' Rollers.
It is coming into general use for this purpose, as rollers will not dry and shrink as when made in the usual way.

OFFICE OF THE DAILY & DOLLAR WEEKLY TIMES, CINCINNATI, Nov. 27th, 1865.
I hereby certify that I have used the Glycerin manufactured by the Messrs. W. J. M. Gordon & Bro., of this city, in the manufacture of printing rollers, and find it a most valuable addition to the composition in general use. THOMAS F. WINTER,
Pressman Times Office, Cincinnati, O.

November 29, 1865.
We have used the Glycerin manufactured by W. J. M. Gordon & Bro, of this city, for the last seven years. We find it in our line of business—printing playing cards, using colored inks to a great extent,—a very superior and indispensable article. We use about one-sixth quantity of it to the amount of molasses in making our rollers. We find it prevents them from shrinking up, and causes them to retain the desired "tack." We confidently recommend the article for the desired purposes. LONGLEY & BROTHER,
Playing Card Manufacturers, Cincinnati, Ohio.
Glycerin is also used by the Cincinnati Commercial and Enquirer, to whom we refer.
We manufacture Glycerine of every quality used, and from our advantage in material we are enabled to sell it lower than any manufacturer in the country.
W. J. M. GORDON & BRO.,
MANUFACTURING CHEMISTS AND DRUGG'STS.
63] N. E. Cor. Central-ave. and 8th st., Cincinnati, Ohio.

MORRIS, TASKER & CO,

PASCAL IRON WORKS

[ESTABLISHED 1821,]

PHILADELPHIA,

Manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap-Welded Boiler Flues, Galvanized Wrought Iron Tubes,

ARTESIAN WELL PIPES,

of Wrought or Cast-Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal Gas-works,; Cast-Iron Street Mains, Bends, Branches, Drips, &c.

Gas and Steam Fitters' Tools, &c.

STEPHEN MORRIS,
THOMAS S. TASKER,
CHAS. WHEELER,
STEPHEN M. P. TASKER.

J. Vaughan Merrick, W. H. Merrick,
John E. Cope.

SOUTHWARK FOUNDRY,

FIFTH & WASHINGTON STREETS,

PHILADELPHIA.

MERRICK & SONS, Engineers,

MANUFACTURERS OF EVERY DESCRIPTION OF GAS MACHINERY.

Retorts, Bench Castings, Condensers, Washers Surubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gas holders, either Telescopic or Single, with Suspension Frames complete; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam or Hand Air Pumps for providing Street Mains Centre Seals, Governors, Wrought or Cast-Iron Line Sieves for Purifiers, Purifier Hoisting Machines, &c., &c.

Address— MERRICK & SONS,
5th and Washington Sts. Philadelphia.

S. FULTON & CO.,

(Successors to Colwell & Co.)

Manufacturers of

PIG IRON & CAST IRON GAS & WATER PIPES.

Also, Heavy & Light Castings of every description, No. 207 North Water street and 206 North Wharves, Philadelphia.

SAMUEL FULTON, THEO. TREWENDT

TO GAS COMPANIES.

THE UNDERSIGNED DESIRES TO undertake the supervision of several small Gas-works, to visit and examine them as often as may be necessary; to obtain and inspect their coal, castings, fire-brick, and other materials; and to manage their general business in such a manner that they shall be under such supervision as is now attainable in large works, at much increased cost. Also, to advise as general Consulting Engineer and expert in practical chemistry.

CHAS. M. CRESSON,
Late Asst. Engineer of the Philadelphia Gas-works
417 Walnut st., Philadelphia.

POOLE & HUNT,
Baltimore, Md.,
are prepared to execute orders for
GAS-HOLDERS,
IRON-ROOF FRAMING,
And other descriptions of
Iron Work for Gas-Works, Water-Pipes, and Heavy Castings,
and Machinery generally.

GEO. H. KITCHEN & CO.,

NEW PATENT

GAS APPARATUS

For Country Residences,
Public Buildings, &c.,

FROM $300 UPWARDS.

EVERY DESCRIPTION OF GAS FIXTURES.

Gas Fitting in all its branches

561 Broadway,
NEW YORK.

WOODEN PURIFYING TRAYS
PATENT
Conically Slotted Solid Wood Sieves
FOR PURIFIERS.

The Conically Slotted Solid Wood Tray or sieve was patented 21st October, 1862, and all persons are cautioned against purchasing them of any other person except the subscriber. The following companies are now using these trays.

Manhattan, New York,
Metropolitan,
New York
Albany
Troy
Brooklyn, L. I.
Williamsburgh,
Citizens
Baltimore Md.
Louisville, Ky.
Chicago, Ill
Cambridge,
And numerous others

Orders received by mail or otherwise.

JOHN L CHEESMAN.
147 Avenue C New York City

JOSEPH LENNIG,

1615, 1617, and 1619 Francis St.,

Above Ridge Avenue, Philadelphia, Pa.,

MANUFACTURER OF

Wet and Dry Gas Meters,

STATION, SHOW, & EXPERIMENTAL METERS,

Photometers, Pressure Registers, Indicators, and Gauges, Governors. Meter Provers, Centre Seals, Fluid Gauges, &c.

GAS APPARATUS

Of the most reliable and approved construction manufactured and on hand at the

UNION GAS METER WORKS.

D. PARRISH, Jr.,

GAS ENGINEER

And Contractor for Coal or Oil Gas-Works.

Estimates given for Gas-Works, Gas-Holders, or any Gas Apparatus.

205 1-2 Walnut st., Philadelphia, Pa.

Box 1956, Post Office.

To Manufacturers of Petroleum Gas.

For sale, Parrish's Patent Gas and Air Mixer, adapted to all works using Petroleum or other oils, by which rich Petroleum Gas is mixed, after it leaves the holder, with a proper proportion of air, giving it the greatest illuminating power, without smoke, through any burners. The apparatus being attached to the outlet pipe, requires no alteration of the works.

Apply at the Gas-Works of St. Nicholas Hotel, No. 63 Mercer st., N. Y., where one can be seen in operation; or address D. Parrish, Jr., St. Nicholas Hotel, New York city, or No. 1416 Arch street, Philadelphia.

SAVING OF FUEL TO PARTIES USING STEAM.
DAMPER REGULATORS.

Guaranteed to effect a great saving in fuel and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms or flexible vessels of any kind. Clark's Patent Steam and Fire Regulator Company, No. 117 Broadway, New York.

THE AUBIN BALLANCED

VALVE WATER METER,

(Used also for Oils and Liquors)

Is now in use by many City Water Cos, because of its low price, simplicity, durability, accuracy under any pressure, and (a great advantage) because it runs with less head than any meter used. Manufactured by H. Q. HAWLEY, Albany, N. Y.

WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.

J. D. WEST & CO.,
No. 40 Cortland street,

R. D. WOOD & CO.,

MANUFACTURERS OF

CAST-IRON PIPE, RETORTS, &c.

Office, 400 Chestnut Street,
PHILADELPHIA.

Great Improvement

IN

Sewing Machines.

EMPIRE

SHUTTLE MACHINE!

Patented February 14th, 1860.

Salesroom, 536 Broadway.

This Machine is constructed on entirely new principles of mechanism, possessing many rare and valuable improvements, having been examined by the most profound experts, and pronounced to be SIMPLICITY and PERFECTION COMBINED.

It has a straight needle, perpendicular action, makes the LOCK or SHUTTLE STITCH, which will NEITHER RIP nor RAVEL, and is alike on both sides; performs perfect sewing on every description of material, from Leather o the finest Nansook Muslin, with cotton, linen, or silk thread, from the coarsest to the finest numbert.

Having neither CAM nor COG WHEEL, and the least possible friction, it runs as smooth as glass, and is

Emphatically a Noiseless Machine!

PRICE OF MACHINES,

COMPLETE:

No. 1, Family Machine, with Hemmer, Feller, Gauge, Braider, & Corder, complete. - - - $60
No. 2 Small Manufacturing, with Extension Table, $75
No. 3. Large Manufacturing, with Extension Table, $85
No 3. Large Manufacturing, for Leather, with Rolling Foot and Oil Cup, 100

One-half hour's instructions is sufficient to enable any person to work this Machine to their entire satisfaction.

Agents Wanted in all Towns in the United States, where Agents are not already established. Also, for Cuba, Mexico, Central and South America, to whom a liberal discount will be given Terms, invariably Cash on delivery.

T. J. McARTHUR & CO.,
536 Broadway.

GAS-BURNERS.

WIGHTMAN BROS.,

IMPORTERS AND

SOLE AGENTS

For the United States and Canada, of

SCHWARZ'S

GERMAN LAVA GAS-TIPS

And proprietors of Winchester's Improved

LAVA TIP GAS BURNERS,

No. 25 Kilby Street,

Boston, Mass.

T. G. ARNOLD,

MANUFACTURER OF

GAS-BURNERS

And Importer of Scotch Tips,

224 and 226 West 21st street,

formerly No. 447 Broome St., New York.

Mercury Cups, Portable Sockets, Burner Pillars, Burner Pliers, &c., &c.

C. GEFRORER,

Manufacturer of

GAS-BURNERS,

For Lighting and Heating Purposes.

Gas Heating and Cooking Apparatus; Fitters' roving Apparatus, &c.

529 Commerce st., bet. Market & Arch, Philadelphia

JOSEPH LEES,

Sole Agent for the sale of

Thompson's Gas Controller

in the States of

CALIFORNIA AND OREGON,

San Francisco, Cal.

Carrington & Co.'s

GENERAL

PURCHASING AGENCY,

In Connection with all the Expresses

No. 30 Broadway,

NEW YORK.

Established 1854.

Purchases to order ANY article wanted from New York, (or from Europe,) for ladies' or gentlemen's use or wear,—comfort or luxury—from a cameo to a cashmere—a seal-ring to a steam-engine.

Goods purchased at current City prices, and forwarded by Express, or as directed.

Commission, Five Per Cent

Remittances, with orders, can be made by Express if preferred, as all Express Agents will take orders, receipt for and forward funds, and see to return of Goods.

THE HAVANA

MEXICAN & BRAZILIAN

EXPRESS.

CARRINGTON & CO.

30 Broadway.

Express for HAVANA and ISLAND OF CUBA by regular steamships weekly.

Express for MEXICO and VERA CRUZ on the 10th and 16th of every month.

Express for ST. THOMAS, BAHIA, and RIO DE JANEIRO each month.

Packages received for United States Brazil Squadron.

Freights should be sent to our office day before sailing of steamer, with invoice, contents and value.

FINKLE & LYON'S

New Family

SEWING MACHINE

Should be known in

IN EVERY TOWN.

To accomplish this at once and save the expense of a *Travelling Agent*, we offer thus, viz:

Any one sending us orders for two machines shall receive one machine free of charge. This proposition cannot avail after we have appointed a local agent in the town.

We have now completed our *new manufacture* at a cost of some $200,000—introducing *new patents*, and such important improvements, that without fear we are able to offer the following stringent guarantee, viz: After a fair trial, if any purchaser does not prefer the Finkle & Lyon Family Sewing Machine to any other, he can return it and have back his money.

This machine has taken many of the highest prizes; *is less complicated than any other first class machine; does a wider range of work without changing; requires no taking apart to clean or oil, no "lessons" to set needle, regulate tension or operate machine.*

Our new Manufacturing Machine is sold on the same terms as the Family Machine.

Please send for a circular with samples of sewing.

Finkle & Lyon S. M. Co.
No. 581 BROADWAY, NEW YORK.

Gas Fixtures and House Furnishing GOODS,

E. V. HAUGHWOUT & CO.,

488, 490 and 492 Broadway.

Corner of Broome street, New York,

Mannfacturers and dealers in

CHANDELIERS & GAS FIXTURES

Have a large and very choice assortment of GAS FIXTURES, which they offer at reduced pri ces, in view of the recent fall in gold. Their

Glass and Fire Gilt Chandeliers, are of entirely new designs,

And well worthy of attention by those who wish to purchase

☞ *Fine Fixtures for their Houses.*

OFFICE OF WM. DAVIDSON,
INSPECTOR OF GAS METERS FOR THE STATE OF NEW YORK.

☞At the above address.

Architectural Iron Works,

13th and 14th streets, near Avenue C.

BRANCH CFFICE 42 DUANE ST.,
NEW YORK.

OFFICERS: { D. D. Badger, President. N. Cheney, Vice Pres. & Act. Tr. C. C. Gordon, Secretary Pro Tem.

PRODUCTS:

Iron and Fire-Proof Buildings, Iron Fronts, Rolling Shutters, Roofs, Domes, Bridges, Railings, Verandahs, Balustrades, Stairs, Cornices, Columns, Capitals, Arches. Window Lintels and Sills, Consoles, Brackets, Rosettes, Urns, Door and Window Guards, Lamp, Awning and Horse Posts, Venetian Blinds, Patent Lights, Iron Side Walks, Rolled, Rivetted and Cast Iron Beams and Girders, and all Architectural and General Iron Work.

H. M. BAILEY, Superintendant of Works.
J. WALTER CLARK, Accountant. J. M. DUCLOS, Arch.

OREGON IRON FOUNDRY,

738, 740, 742 and 744,

Greenwich Street, New York.

CASTINGS FOR

GAS WORKS

OF ALL DESCRIPTIONS, INCLUDING

Purifiers, Exhausters, Compensators, Self-Acting Valves, Branches, Bends, &c.

FLOYD'S PATENT

Malleable Iron Retort Lid.

SABATTON'S PATENT

Furnace Door and Frame.

Refers to—J. A. Sabatton, Esq., Engineer Manhattan Gas Co.—Col. A. J. White, Metropolitan Gas Co.—C. C Mowton, Engineer New York Gas Light Co.—J. Mowton Saunders, Engineer Baltimore Gas Co.—John T. Harrison, Engineer Savannah Gas Co.

135] HERRING & FLOYD, Proprietors.

SILAS C. HERRING. JAMES R. FLOYD.

KEROSENE

Cooking Apparatus.

All the cooking for a family can be done with Kerosene Oil, with less trouble and at less expense than by any other fuel.

Our stoves give no smoke or odor, and are not liable to get out of order, being as simple in every respect as a kerosene lamp. The Baker, Boiler, and Flat-Iron Heater are the only special articles of furniture required. For all other purposes, ordinary stove furniture may be used.

We would call attention to the fact that for the past three years, the Company has devoted itself almost exclusively to the manufacture of Kerosene Cooking Apparatus, and is prepared to guarantee that every article shall perform all that is claimed for it.

Liberal discounts to the trade. Send for circulars and price list.

KEROSENE LAMP HEATER CO.,

206 Pearl Street,

NEW YORK.

THOMAS CASSIDY,

Iron Founder & Pattern Maker

Corner Hudson and Park Avenues,
BROOKLYN.

Iron Store Fronts put up at short notice.

Square and Round Columns, Truss Girders, Vault Beams, Window Lintels, Sills, &c.

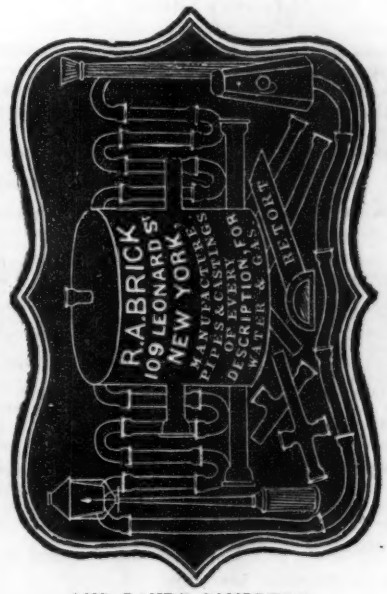
A large assortment of Railing Castings constantly on hand, or made to order, at the shortest notice.

Lamp Posts—Brooklyn Pattern.

☞A large stock of the usual sizes of Round Columns kept on hand.

DRIVING PIPE,

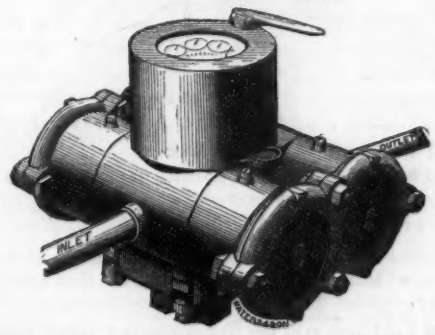
BERGEN IRON WORKS,



OFFICE 109 LEONARD STREET, NEW YORK.

AND BANDS COMPLETE.

H. R. WORTHINGTON'S



PATENT WATER-METER.

This Meter is also used for the measurement of Oil —it combines

ACCURACY, SIMPLICITY, and REMARKABLE DURABILITY with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.

HENRY R. WORTHINGTON,
61 Beekman steet, N. Y.

WILCOX & GIBBS' SEWING MACHINE.

It is entirely noiseless. A patented device prevents it being turned backward. The needle cannot be set wrong. It received the gold medal of the American Institute in 1863. Send for a circular containing full information, notices from the press, testimonials from those using the machine, &c.

JAMES WILCOX,
Manufacturer, 508 Broadway, New York.

PRINCIPAL OFFICES:

NEW YORK—508 Broadway.
BOSTON—323 Washington-st.
PHILADELPHIA—720 Chesnut-st.
CHICAGO—133 Lake st.
CINCINNATI—80 West 4th-st.
LONDON—135 Regent-st.
HAMBURG—44 Herman-st
PARIS—82 Boulevard d Sebastopol
ST. PETERSBURGH—15 Gorochovay
VIENNA—9 Wildpretmarket.
BRUSSELS—12 Rue Croisade.
SYDNEY, Australia—212 Pitt-st.

Mining & Petroleum Standard
AND
AMERICAN GAS-LIGHT JOURNAL.

Published on the 2d and 16th of Each Month

At No. 22 Pine Street, New York.

BRYANT, CALLENDER & CO.,
EDITORS AND PROPRIETORS.

Profs. PARTZ & BUCK, Consulting Chemists.

FRIDAY, NOVEMBER 2, 1866.

WISHING TO MAKE this Journal an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its colums are devoted, the publishers solicit letters from all among them who make the study of those subjects a pleasure, or a profession.

CONTENTS.

Cheeseman's Solid Wood Trays for Purifiers—Illus.	129	Applied Science,	132
Steam Car for Street Railroads,	129	Crushing and Stamping superseded,	132
Electricity from Heat—Convertibility of Force,	129	Petroleum in Italy,	132
Gas Purification,	130	Oil in the West,	133
Practical Receipts,	131	Shall I put a Pump in my Well,	133
Foreign Scientific Items—Translations,	131	Working Tests of Sodium-Amalgam in Nova Scotia,	133
Interesting Statistics of the United States,	131	Prosperity of Manufacturing Interests in Paterson N. J.,	136
The process of Roasting ores—translated from the German	131	New Hampshire Gold Mines,	136
Concrete Foundation,	132	Plastic Slate Roofing,	136
		Utilization of Corn Fibre,	136
		Sale of Coal—Higher Prices,	137

Prosperity of Manufacturing Interests in Paterson, N. J.

GWYNNE'S HYDRO-CARBON PROCESS.

Being lately called on a business errand to the above named place, now almost a suburb of New York, we were astonished by the evidences of prosperity presented in its streets. A sewing-silk establishment of large proportions has just been erected for the Dale Co. opposite the R. R. Station, and and others are in operation near by. Machine shops, Locomotive shops, sending out 150 to 200 locomotives per year, with spinners and weaves and works of all kinds abound in all the high-ways and by-ways. A cathedral of immense size is going up. The baronial mansion and grounds of the Colt family are crowded, and partly swallowed already by the advancing tide of business activity. New residences of all classes are springing up in great numbers, all bearing witness that wealth has here found intelligent and liberal hands for its employment.

We did not visit the Gas Works but heard confirmation of the announcement made some time ago that new works on a greatly enlarged scale are now being erected, the old works being entirely inadequate to supply the wants of the present population. Gwynne's hydro-carbon process so successfully used at Elizabeth N. J., is to be used in all the benches here, and the works we are even told, will be remarkably well arranged and proportioned and of a size sufficient to meet the wants ol this growing city for many years to cone. The bnildings are ot brick and are already up to the eaves. The large tanks 85 feet in diameter is completed and ready for the erection of the holder by the skilful hands of Kraft, of Philadelphia. The first it is said, will be lighted in the new works sometime during the coming winter and impatiently waited for. We shall not fail to visit and report for the benefit of our readers upon this exhibition of an improvement which is exciting great interest at present among the intelligent and progressive portion of the gas fraternity.

New Hampshire Gold Mines.

The new gold discoveries in Lisbon, N. H., are evidently beginning to attract consibeable attention not only of the mining fraternity at large but the scienticist also; and it may, when at our very doors almost, such splendid results are obtained as there, where the yield is said to be $867 in gold and $150 in silver to the ton of quartz. It has been published that the discovery of gold in Lisbon was accidentally made by a gentleman who was passing through the town on his way to the White Mountains last summer (1865) for his health. Most generally valuable discoveries of mines it is said, are made by the unscientific and by accident, but in this case it may be interesting to know that a year previous, Professor Henry Wurtz had paid a visit to to this section and made a report upon the property of the New Hampshire Silver Lead Co., in the adjoining town of Lyman, a portion of which we published at the time.

In one sample of lead ore taken from a small vein. Prof. Wurtz found considerable gold and an assay of the same made by Prof John Torrey, U. S. Assayer, gave 56.96 oz. lead and 1.006 oz. gold, or about $20 to the ton.

In the report Prof. Wurtz says: "The discovery of gold, for the first time, in this part of New Hampshire, and in such important quantity, is of great interest, and encourages further examinations of the rocks and minerals upon your property for this metal."

"The suggestions to assay these galenas for gold as well as silver, was made by me in consequence of the striking resemblence of this belt of talcose schists and its included veins to certain belts of the same rock in the gold regions of North Carolina."

We understand that Mr. Sperry of Messrs. Morey & Sperry, of this city, has just erected two of Hepburn & Petersons Pans at the Lisbon mines, and in conjunction with Prof. Wurtz, will try the Sodium-Amalgam process to extract the gold. We shall revert to this matter again.

Plastic Slate Roofing.

Our JOURNAL having been engaged as a medium to convey to the licencees of the Plastic-Slate Roofing Company, and to the public, information in reference to this most valuable invention. We shall publish such facts and experiences from time to time, in the progress of the business as will keep all parties interested fully posted in all matters of importance.

The demand for the Plastic-Slate at present exceeds the possibility of prompt supply, but as so much attention is being given to the work by the licensees, and as many new Slate grinding mills are being constructed, there will soon be a prompt execution of orders for roofing in any part of the country.

First in importance to the permanent success of the enterprise is that *all the work done should be well done*, and to this end we copy from the first annual report of the Secretary of the company, J. M. Allen, Esq., a resolution drawn up by Mr. Van Orden and passed unanimously at the meeting of stockholders on the 3d and 4th days of October, 1866.

Be it Resolved,, That we deem it exceedingly desirable and necessary that all Licensees throughout the country have a *uniform* method of making a Plastic Slate roof, and do earnestly advise them, for the welfare of all interested, and for the reputation of *Plastic Slate itself*, to cease making roofs, (exept an occasional one for experiment) by *any* method that has not been *pratically tested* for at least *one year*, and knowing that the *only mode* that *has* been pratically tested, not only for *one* year but for more then *three* years, is the following; therefore we urge for the benefit of each, its exclusive adoption, until the next annual meeting, viz—With the ordinary felt, use two thicknesses, one directly over the other, which should be put on up and down the roof, beginning at the eaves at the end of the building, and if a roof of double pitch, roll it up to the ridge and down to the eaves on the other side. Let the next layers lap upon the first about two inches Now comes the *most particular part of the job*, which is, *to secure the joints*, which is done by means of triangular wooden cleats, sawed out of half inch board free from knots, which are to be nailed over the laps from eaves to comb, with lath nails, about four inches apart. The cleat, and the felt for a couple of inches on each side, should then be well coated with stiff Plastic Slate, and covered with a strip of felt four inches wide, which has been previously moderately soaked in water to make it soft and pliable. This strip of felt is then laid on the cleat, and well pressed down into the mastic by means of a roller with a groove turned in the center to fit the cleat; after which the ends should be secured with 8 oz. tacks, and should any part of the strip show signs of curling up, secure it with a tack, though this will not occur if the work is properly done.

On flat roofs use flat wood cleats, one-quarter of an inch thick by three-quaters of a inch wide, and cover with Plastic Slate and a four inch strip of felt as above directed.

The felt should be drawn tightly over the eaves, and secured by a square cleat, well nailed on the edge of the roof. The verge should be secured with a cleat the same as the joints. The roof is now ready to be coated. Take a pailful of Plastic Slate and pour on one side of the roof at the ridge, taking one course at a time. Then take a roofing brush, and work it down to the eaves, leaving on a coat, about one-eighth of an inch thick. Some prefer a trowel, which works well, though we like the brush and are inclined to the belief that it makes a better job. Dry clean sand, sifted upon the roof after the Slate is spread and before it has set, improves the appearance and does not injure the roof.

In places where wood cleats, as described, cannot be used, use narrow tape and tacks, and cover it with Plastic Slate and felt as you do the wood cleats. *All joints, no matter what kind of cleat is used, or even if no cleat is used, must be covered with a strip of felt as above described.*

In no case should the coat exeed one-eighth of a inch in thickness—less than one-eighth is better than more.

It is said that a piece of heavy rubber or leather belting (instead of bristles) partly inserted into a block, with a long handle to it, is very good for spreading.

With our patent, double slate felt only one thickness is required, laid in the same way, *invariably* securing the joints as above described.

Under *no circumstances* use tacks between cleats. Should the felt be torn, stick a patch over the imperfection with stiff Plastic Slate, *invariably* avoiding the use of TACKS.

In coating tin roofs, remove all scales and sweep the roof pesfectly clean with a broom. Stick a patch of felt over every hole crack or break with stiff Plastic Slate. Then apply with a *brush* a medium coat all over the roof, taking particular pains to rub it well into the seams or joints—not across chem but lengthwise. This is a matter of the utmost importance, and will never fail to make a perfect roof.

We believe the slate should be ground as fine at wheat flour, and sifted through a fine sieve, or bolted to remove such particles as may pass between the stones unpulverized. It should be *thoroughly* mixed with the tar, to about the consistency of plasterers' mortar, and should stand after mixing it at least 24 hours before being used. The longer it has been mixed, the better will be the roof.

Utilization of Corn Fibre.

The great demand for materials for the manufacture of paper, which is constantly increasing to an enormous extent, in this country especially, has given rise to various attempts to find a substitute for the principal material hitherto used, namely, rags. Straw, wood, and some few other substances have been and are employed to a limited extent to produce the coarser kinds of paper; but it is generally supposed that nothing could take the place of linen and cotton in the manufacture of the finer qualities. Hence the supply has not been equal to the demand, and the price in this country has increased three or four fold since the war, owing to the falling off in the supply of cotton from the South, and some of the European governments, have for this reason prohibited the importation of those symbols of poverty. The rags produced in this country are entirely inadequate to the demand, and form but a small portion of those used by our manufacturers. The amount imported for the quarter of the present year ending in June, were valued at $426,776. In the ten years previous to and ending in 1865, the importations amounted to 209,883,718 pounds.

Ingenuity has set to work to provide a substitute, stimulated no doubt, by the great prospective reward

in case of success. Hence we have before us the prospectus of the United States Corn Fibre Company, with a valuable report of Prof. R. Ogden Doremus, from which we glean some interesting information for the benefit of our readers. This company operate under Letters Patent of the United States, taken out by the inventor, Chevalier von Auer, for a process similar to that now worked by the Austrian Government, which process is in full operation there. The largest manufactory is that belonging to the Austrian Government, at Schlögelmülhe, near Vienna. The corn-stock there used is brought from Hungary, and a great variety of samples of the materials produced from them, such as bagging of every texture and style, crash, oil cloth, carpeting, &c., and paper made from corn fibre, of every description, have been imported here.

The inventor, Chevalier von Auer M. Welsbach, is an Austrian, and by the liberal aid of his government has been enabled to bring the invention to the highest degree of perfection, and make the manufacture of corn fibre one of the established pursuits of the country; and there is every reason to believe that it will soon become an important branch of manufacturing industry in the United States, that may produce as great a revolution in certain branches of industry as the previous introduction of the cotton plant.

The maize, or corn plant, is indigenous to our soil, easily cultivated, and of a hardy nature, and can be produced in almost any State in the Union; an unlimited demand already exists for the material it yields, and the supply is unlimited.

The mills, in Austria, adapted to manufacture this material, produce from the husks, leaves, &c., of Indian corn, 25 per cent. of a long fibre which can be spun like flax and woven into cloth; 20 per cent. of the pulp for making paper, and 15 per cent. of gluten, which can be used in various ways as an article of food for cattle, and a substitute for corn in distilling purposes, &c., &c.

To form some idea of the value of the corn fibre, it is only necessary to state that we annually import from Ceylon half a million of dollars in value of coir and coir matting. From Calcutta, five years prior to the rebellion, nearly $4,000,000 in value of gunny cloth, $2,000,000 worth of which were employed for cotton bagging, and $3,000,000 worth of Manilla hemp.

The exportation of jute from Calcutta, in the years 1850 and 1851, amounted to $1,000,000; the annual consumption of jute, in England, is estimated at 100,000 bales. Besides these importations, our mills and looms of the East are constantly overworked in manufacturing burlaps, sail-cloth, grain sacks, bagging for the cotton crop of the South, salt sacks, towelling, hop bagging, fillings for satinets, filling in felt hats, stuffing for matresses, furniture, &c., and various other purposes too numerous to specify. In fact, the demand for this product is unlimited, and it is believed that, from its low cost and easy supply, that not only can we fill our own demand, but supply foreign countries.

There are now in active operation in this country (mostly in the New England and Middle States), over one thousad paper mills, employing a capital of nearly $40,000,000, and yielding a production of nearly twelve hundred tons or more of paper per day, in its different styles and grades, worth $75,000,000 per annum.

Rags now rule from eight to twelve cents per pound, or $160 to $248 per ton, according to quantity; coarse papers are fabricated from rags costing from 5½ to 7 cents per pound, or $110 to $140 per ton. Twenty-five per cent. is allowed for loss in reducing rags to pulp. Hence, 1,200 tons of paper will require 1,500 tons of rags, which, at an average between the minimum and maximum prices, would be worth, say eight cents per pound, or $160 per ton.

Allowing 250 working days, we find that for a year's production of paper, the material demanded is immense, viz.: 1,500 tons for 250 days—375,000 tons, at $160 per ton costs $60,000,000, from which nothing but paper can be obtained. Now it is said, that it will require 7,200 tons corn-stock to furnish the pulp for 1,200 tons paper per diem, which, per year of 250 days, will amount to 1,875,000 tons; which, at $10 per ton, costs $18,750,000, leaving a difference in favor of corn of $41,250,000. But, besides this paper pulp, the corn yields 25 per cent, or 468,750 tons of fibre for spinning, worth, say $200 per ton, making $93,750,000, and 15 per cent., or 281,250 tons of gluten or feed, worth, say $40 per ton, equals $11,250,000. Producing thus, commodities worth $165,000,000. Against a cost of $18,750,000, leaving $146,250,000.

The first paper mill in this country was erected in 1693, at Roxborough, near Germantown, Pennsylvania. The second mill was erected in 1728, at Elizabethtown, New Jersey, yet at the present time we have outstripped all other countries in this race of competition; we have mills which turn out seven tons of paper per diem. Our paper production and the capital employed exceeds that of England and France, combined.

In 1850 there were 415 paper-mills in Great Britain, which produced 62,960 tons of paper per year, having a value of £200,000.

In 1864 Great Britain produced 88,900 tons of paper from rags; France, 78,150 tons; and the United States, 135,000 tons. A nation's advancement in civilization may be estimated by the amount of rags it consumes it has been said. According to this standard, the exalted position of our land is certainly most enviable.

Great Britain consumed in 1854,.....	201,000,000	pounds of rags.
France do.....	225,200,000	" "
The United States do..	405,000,000	" "

Yielding at the rate of 4 55-100 pounds *per capita* for the population of Great Britain and France, and 10 80-100 pounds *per capita* for the United States.

Our immense numbers of daily, and weekly, and monthly journals, consume many thousand of tons of paper per diem. The *Tribune* alone uses thirty tons of paper per week, and the *Herald* probably as much or more. Cheap literature and the general diffusion of knowledge increase the demand for this material constantly. The additional uses of paper, for walls of rooms, roofing, wrappers, boxes, shirt collars, bosoms, and cuffs, hats, shoes, and for trunks, tubing, furniture, photographs, and constantly other new uses for it are being discovered. Hence the necessity and value of some new, and cheap, and universal material like the corn-stock.

Mr. R. L. Delisser was delegated to go to Austria, and examine the process used at the Government Mills and elsewhere, and discovered that corn-stock was driving rags out of market, and opening a new and profitable branch of industry to the country. His report is complete and interesting, showing the various products and uses of the material, &c. He brought with him 150 samples of various descriptions, viz.: parchment, drawing, photographic, tracing, tissue, printing and writing papers, twenty samples of cloth, crash, baling; also, samples of oil cloth, fibre for spinning, gun cotton, pulp gluten, &c.

These samples may be seen at the office of Mr Chas. F. Loosey, Consul-General of Austria; Mr. C. F. Copeland, 99 Water street, also has samples, and is trustee with Mr. G. S. Hutchinson and Mr. W. N. Puffer, 33 Wall street, who are authorized to receive subscriptions to the stock.

COAL A SHADE HIGHER IN PRICE.—The regular sale of Scranton coal took place at noon, Oct. 31st, at the office of the Delaware and Lackawanna Company No. 26 Exchange place, before a large attendance. The prices were rather higher than those obtained at the previous sale as follows:—

Tons.	Sept 26.	Oct. 31.
6,000 steamboat	$5 00 a $5 11	$5 37 a $5 62½
9,000 lump	4 20 a 5 25	4 50 a 4 75
8,000 grate.....	5 00 a 5 25	5 37 a 5 60
3,000 egg.....	5 37 a 5 62	5 65 a 5 70
7,500 stove.....	6 37½ a 6 60	6 45 a 6 62½
6,500 chestnut.....	4 10 a 4 25	4 12½ a 4 37½

The advance is evidently owing to the approaching close of navigation, and not to any actual or anticipated scarcity of the article in the market. Indeed it is a positive fact that there is nearly one-third more coal in the yards in this city and vicinity than there was last year. The increased price therefore is not founded upon any true basis of supply and demand.

GAS TAR.

PROPOSALS WILL BE RECEIVED FOR THE Purchase of the TAR of the ALBANY GAS-LIGHT COMPANY'S WORKS from the 1st January, 1867.
Albany, N. Y., October 20th, 1866. 65-tf

J. FIRMIN,

Gas Fitting and Plumbing,

Nos. 64 & 66 Maiden Lane, cor. William-st.

Residence, No. 1147 Broadway, near 26th-st.

HOUSES FITTED UP WITH PLUMBING AND GAS WORK IN THE MOST MODERN AND IMPROVED STYLE. SEWERS CONNECTED. BRASS AND LATHE WORK. JOBBING IN ALL ITS BRANCHES ATTENDED TO WITH PUNCTUALITY AND DISPATCH.

GAS BILLS REDUCED.

Gas Lights perfected upon New and Unerring Principles.

REFERENCES:

At A. T. STEWART'S the gas-lights were improved and the gas bills reduced one-third, amounting to several thousands of dollars per year.—A. O. WILLCOX, No. 40 Wall-st.

At the TRIBUNE ASSOCIATION gas bill reduced upwards of one hundred dollars per month, and better lights given.—SAMUEL SINCLAIR Publisher.

At H. B. CLAFLIN'S, late Claflin, Mellen & Co., gas bill reduced—amount not yet ascertained—but it will be at the same ratio, and light improved.—Mr. BANCROFT.

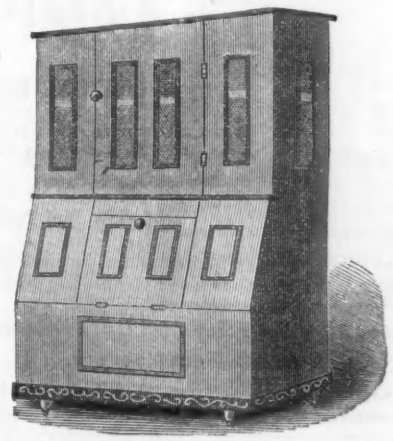
At WM. SCHIEFFELIN & Co.'s, corner William and Beekman-sts., good light obtained and maintained at all parts of the premises, without additional cost—a result despaired of even by the Gas Co. owing to the deficiency of supply. No deficiency by FIRMIN'S system.

Similar results guaranteed under similar circumstances, or NO CHARGE. 65-88

A Rare Chance to Invest.

The Excelsior Cabinet Refrigerator

AND PROVISION SAFE COMBINED.



THIS NOVEL AND COMPLETE INVENTION is a great improvement in Refrigerators, as it combines two valuable features, viz: It can be used as a REFRIGERATOR or as a PROVISION SAFE. Its great convenience for families makes it the most desirable meat and provision saver in the world.

This patent, or the right to manufacture, is for sale.
Apply to BONNER & CO.,
165-tf 117 Nassau-st., Room 17.

EMPIRE LINE

FOR SAVANNAH, GEORGIA,

Every Saturday, the elegant Side-Wheel Steamships

SAN SALVADOR,

Commander, Joshua Atkins, and

SAN JACINTO,

Commander, Winslow Loveland.

Every SATURDAY, from pier 13 North River.

Have been placed on the route to Savannah by the Atlantic Mail Steamship Company of New York, and are intended to be run by them in a manner to meet the first class requirements of the trade.

The cabin accommodations of these ships are not excelled by any Steamers on the coast, and although their carrying capacity is large, their draught of water enables them to insure a passage without detention in the river

San Jacinto,	Saturday,	Oct.	6	San Jacinto	Saturday,	Nov.	3
San Salvador,	..	"	13	San Salvador	..	"	10
San Jacinto,	..	"	20	San Jacinto	..	"	17
San Salvador,	..	"	27	San Salvador,	..	"	24

Returning, leave Savannah every Saturday at 3 o'clock, P. M.

Bills of Lading furnished and signed on the Pier.

For further particulars, engagement of Freight or passage, apply to

GARRISON & ALLEN, Agents,
No. 5 Bowling Green.

Agent at Savannah, B. H. HARDEE.

ALBERT C. KUCK,

Manufacturer and Dealer in

COAL OIL

LAMPS,

CHIMNEYS,

BURNERS,

WICKS,

SHADES,

BRACKETS,

AND

CHANDELIERS

In all varieties and at manufacturers' prices.

AGENT FOR THE CELEBRATED

"Eureka" and "Nonpareil" Lanterns.

FRUIT JARS OF ALL KINDS AND SIZES.

57 FULTON STREET, NEAR CLIFF St.,

NEW YORK.

F. H. LOVELL & CO.,

Successors to Alfred Bliss & Co.

MANUFACTURER AND JOBBERS OF

KEROSENE

LAMPS

CHANDELIERS,

BRACKETS,

AND

Lamp Trimmings

GENERALLY.

Station, Sugar House, Street and Coal Oil Lanterns.

No. 233 Pearl Street,

159-182 *NEW YORK.*

Illustrated catalogues and price lists furnished on application.

NEW YORK LAMP COMPANY,

259 Pearl Street, New York.

We Would call especial attention to our recently improved

UNION BURNER,

which now burns without SMOKE OR ODOR. With Coal or Petroleum Oil makes the cheapest light known,

One Cent for Eight Hours.

The improved Union Burner without chimney, for a hand or portable night lamp is unrivalled.

Patented in the United States, England, France and Belgium.

NEW YORK LAMP CO.,

58 259 Pearl-street, near Fulton, New York.

Something New and Useful.

A POCKET LANTERN, which, when folded, occupies the space of a cigar case, and when open gives a good light. The most convenient article for any one who is liable to be out at night. Sample sent by mail on receipt of one dollar.

Address

NEW YORK LAMP CO.,

57 259 Pearl-street, New York.

The Aladdin No-Chimney Burner

GIVES A BRILLIANT LIGHT WITHOUT THE use of a chimney. Fits on to almost all kerosene lamps. It is the best no-chimney burner made, and no family should be without them. Samples sent by mail on receipt of 50 cents.

Address

NEW YORK LAMP CO.,

57-62 259 Pearl-street, New York.

R. L. DELISSER & CO.,

DEALERS IN MINERAL LANDS

—AND—

PATENT RIGHTS,

No. 69 Beaver St., NEW YORK.

152-176

WILLIAM ELTING

Manufacturers Agents for the Sale of

PORTABLE AND

Stationary Steam Engines,

BOILERS AND MACHINERY,

No. 95 Liberty-St, NEW YORK.

☞ Leather and Rubber Belting supplied at usual rates. Circulars sent on application. 55-78

MOREY & SPERRY,

Manufacturers of

HEPBURN & PETERSONS, AND BEATH'S

Amalgamators, Stamp Mills,

Quartz Crushers, and other

MINING MACHINERY.

ALSO AGENTS FOR

Foundries in San Francisco, Cal., and are prepared to make time contracts to erect Mills completed, on the premises in California, Nevada and other Territories.

Office No. 95 LIBERTY ST., Rooms 10 & 11.

152-176 **New York.**

A. HITCHCOCK,

Inventor and Manufacturer of the

Cam Quartz Breaker and Pulverizer,

REVERSIBLE ROLLER MILL,

IDAHO MILLS & AMALGAMATORS,

Adapted to All Kinds of Power.

Unequalled for utilizing power—avoiding friction and wear,—rapidity of work, and facility of transportation and adjustment. Also, **Hitchcock's Adjustable Tubular Self-cleaning Boiler,** and other valuable Patents, for which license to manufacture will be granted on reasonable terms.

Circulars furnished on application.

53-76 *Office No. 4 & 6 Pine Street, New York.*

GEO. H. BRONSON,

132 Malden Lane, New York,

Dealer in

Paraffine Machinery Oil,

From PURE CANNEL COAL, adapted to all classes of

Stationary Machinery, Woolen Factories,
Locomotive Engines, Cotton Spindles,
Railroad Cars, Sewing Machines, &c.

Paraffine Wax and Paraffine Wax Candles. Also the best brands of Burning Oils. All Oils guaranteed to answer the purpose for which they are recommended.

57 80

O. B. GRAY,

DEALER IN ALL KINDS OF

INDIA RUBBER GOODS

Vulcanized Machine Belting,

Conducting, Hydrant, and Engine Hose,

GUM STEAM PACKING,

Amidon's Improved Clothes Wringer,

And all kinds of Useful and Fancy Rubber and Vulcanite Goods,

No. 201 Broadway,

Middle of the Block between Fulton and Dey Streets, NEW YORK.

WILLIAM S. CARR & CO.,

Succesor to Sawyer & Co.,

SOLE MANUFACTURERS OF

Carr's Patent Water Closets,

URINAL VALVES, &c.

Also Manufacturers and Dealers in PLUMBING MATERIALS OF EVERY DESCRIPTION, Plumbers' Brass Works, Earthen Ware, Pumps, Iron Drain Pipes, Traps and Sinks, Copper Bath Tubs, Showers, &c., &c.

OFFICE AND MANUFACTORY

149, 151, 153, 155, 157 Centre Street, cor. Canal,

NEW YORK.

Illustrated Catalogue and Price List sent on application.

152-176

THE WOODWARD

Steam Pump Manufacturing Company,

MANUFACTURERS OF THE WOODWARD PATENT IMPROVED

SAFETY STEAM PUMP,

—Adapted for Mining and Fire Perposes—and

Steam, Water & Gas Fittings of All Kinds.

Also, Wholesale and Retail Dealers in WROUGHT IRON PIPE, BOILER TUBES, etc.,

Woodward Building, 76 and 78 Centre St.,

corner of W or th treet, Formerly 77 Beekman Street, *New York.*

53 GEO. M. WOODWARD, Pres't. 64

CHARLES H. REICHMANN,

Manufacturer and Jobber of

LAMPS,

Petroleum Stoves, &c.

AND IMPORTER OF

Porcelain Shades,

WICKS, &C.,

No. 45 Fulton St.,

[Bet Pearl and Cliff]

NEW YORK.

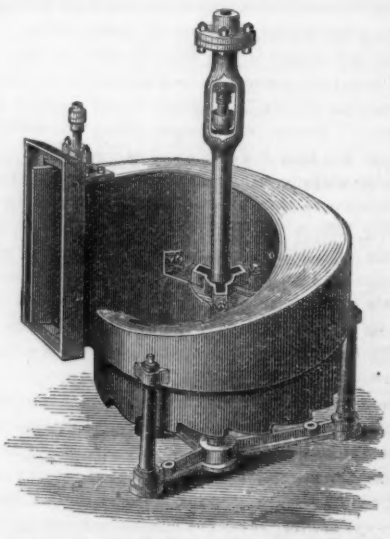
ALL ORDERS promptly filled for his Patent Petroleum Stoves or Lamp Heaters, which are acknowledged to be superior to any other article of the kind now in use, as regards economy in consumption of oil, as well as simplicity of construction.

These Cooking Apparatus are used like any coal oil lamp, being provided with a sheet metal chimney, in consequence of which they burn without odor or smoke. They radiate no heat into the room, and are therefore very desirable in hot weather.

Also, Nursery and Night Lamps combined, a superior and cheap article for nursery or sick room; has a kettle, cup and pan, complete.

STEVENSON'S

Helical Jonval Turbine Water Wheel,



For first-class mills and factories where great economy of water and simplicity and durability are required.

Manufactured by the Patentee,

J. E. STEVENSON, Hydraulic Engineer,

40 Dey Street, New York,

☞ tevenson's Jonval Turbine Water Wheel gave the highest per centage of power over all others at the trial of Water Wheels at Fairmount Works, Philadelphia, March 9th, 1860. NINETEEN WHEELS WERE TESTED. The only practical test on record.

Also Manufacturer of

Gang, Muley and Circular Saw Mills,

SHINGLE AND LATH MILLS,

Of the very best quality. **STEAM ENGINES AND BOILERS** especially adapted to Lumbering purposes.

FOR SALE--Portable Flour and Grist Mills, Water Wheel Governors, Rotary, Hand and Power Pumps, Circular Saws, Rubber and Leather Belting.

Lester's Improved Mechanical Oil for lubricating purposes.

53-76

MANHATTAN

Fire Brick & Enamelled Clay Retort Works,

MAURER & WEBER,

(Of the late firm of B. Kreischer & Co.)
PROPRIETORS.

Office & Works in 15th street, Avenue C,

MANUFACTURERS OF

Fire Brick and Tiles,

OF ALL SHAPES & SIZES,

Fire Mortar, Clay and Sand.

☞Articles of every description made to order, at short notice. (135

HY. MAURER. ADAM WEBER.

NEW YORK

Fire Brick and Clay Retort Works

☞ *Established in* 1845, ☜

(Branch Works at Kreischerville, Staten Island,)

B. KREISHER,

Office 56 Goerck St, cor. Delancey, New York.
GAS RETORTS, TILES and FIRE-BRICK of all shapes and sizes.
FIRE MORTAR, CLAY, and SAND.
Articles of every description made to order at the shortest notice.
B. KREISCHER.

J. K. BRICK & o.,

BROOKLYN CLAY RETORT,

—AND—

FIRE BRICK WORKS,

VANDYKE STREET, BROOKLYN, N. Y.
JOSEPH K. BRICK, EDWARD D. WHITE.

J. H. GAUTIER & CO.,

MANUFACTURERS OF

Gas Retorts, Tiles, Fire Brick,

Black Lead Crucibles, and Carburet of Iron Stove Polish,

JERSEY CITY, N. J.
Refer to—Manhattan Gas Light Co., New York. [135

Philadelphia Fire Brick Works,

Corner of Vine and Twenty Third sts., Philadelphia,

JOHN NEWKUMET,

Manufacturer of all kinds of FIRE-BRICK, GAS-HOUSE TILES, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice.

PRINCE'S METALLIC PAINT,

AN INDESTRUCTIBLE COATING FOR

IRON, TIN, and WOOD.

It consists of seventy-two parts Oxide of Iron, and twenty-eight parts Cement Lime Stone in the one hundred pounds.

It has much more body than red or white lead. It is warranted perfectly water and fire-proof and to withstand a greater heat on metals, without scaling, than any other paint in use.

It is a perfect cover for all kinds of iron, tin, or wood-work, out-houses, and canvas coverings. It prevents and arrests the corrosion of metals, and is not affected by the action of salt, gases, acids or ammonia.

It hardens under water, as has been fully demonstrated by its application to gas-holders, by many of the largest gas companies in the United States; which companies having thoroughly tested its properties as herein claimed, pronounce in its favor over any other paints in the market, even though said at double its price.

As a coating for patterns of iron or wood, when mixed with shellac, it is much superior to beeswax, oil, or shellac alone, as has been proven at the large founderies in the country.

For patching boilers and making joints, it is considered superior to red lead, or any other preparation.

For cleaning metals it takes the place of crocus, ouge, and emery, being better and cheaper.

This Paint requires no more oil than dry lead or zinc, and much less than the ordinary mineral paints. It is free from any waste, and possesses a spreading and covering power unequaled.

Terms, by the Barrel or Half Barrel, Five Cents per Pound.

A liberal discount made to parties purchasing by the ton.

A Barrel or Ton will be forwarded to any gas companies desirous of testing its qualities, for which there will be no charge if it does not give entire satisfaction as being the cheapest and most durable of all other Paints in the market.

Also, Prince's Imperial Black Paint, and Prince's Protoxide of Iron.

DANIEL SLOAN, General Agent,
115 LIBERTY STREET, NEW YORK.

Local Agent—CALVIN GAY, 29 Federal st., Boston.

AMALGAM BELLS,
AMALGAM BELLS,
AMALGAM BELLS,
AMALGAM BELLS

At prices within the reach of every Church, School, Cemetery, Factory, or Farm in the land. Their use throughout the United States and Canadas for the past six years has proven them to combine most valuable qualities. Among which are TONE, STRENGTH, SONOROUSNESS, and DURABILITY OF VIBRATION, unequalled by any other manufacture. Sizes from 15 to 5,000 lbs., costing TWO-THIRDS LESS than other metal, or 25 cents per pound, at which price I warrant them twelve months. Old bell metal taken in exchange, or bought for cash. Send for a circular to the manufacturer,

JOHN B. ROBINSON,
No. 36 DEY STREET, NEW YORK.

List of Academy, Steamboat, Fire-alarm, and Church Bells, with particulars as to Weight, Sizes, Price of Bells, Hangings, etc.

Weight of Bells.	Diameter.	Price of Bells without Hangings.	Price of Patent Hangings.	Price of Bell and Hangings complete.
225 lbs.	26 inches.	$56 00	$15 00	$71 00
275 "	42	69 00	18 00	87 00
375	36	94 00	22 00	116 00
450	84	112 00	25 00	137 00
600	02	150 00	30 00	180 00
750	89	188 00	35 00	225 00
1,000	64	250 00	42 00	292 00
1,200	48	300 00	45 00	345 00
1,400	50	350 00	50 00	400 00
1,600	52	400 00	54 00	454 00
1,800	55	450 00	60 00	510 00
2,000	58	500 00	62 00	562 00
2,500	60	625 00	72 00	697 00
3,000	63	750 00	85 00	835 00
3,500	66	875 00	87 00	962 00
4,000	69	1,000 00	100 00	1,100 00
4,500	72	1,125 00	113 00	1,238 00
5,000	75	1,250 00	125 00	1,375 00

List of Prices, Weights, and Sizes of Farm, Hotel, Steamboat, Schoolhouse, Shop, and Factory Bell.

These Bells are fitted with Yoke, Standard's Crank and Bolt, complete for use.

Weight of Bell and Hangings.	Diameter.	Cost of Bell and Hangings complete.
15 lbs.	7 inches.	$3 75
20	8¼	5 00
35	10	8 75
50	12	12 50
75	16	18 75
100	18	25 00
150	20	37 50
200	22	50 00
250	24	62 50

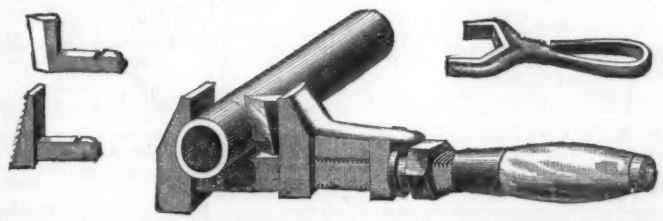
Larger Sizes made to Order at 25 cents per pound.

Guarantee.—All Bells sold at the above prices WARRANTED against breakage by fair ringing, for TWELVE MONTHS from time of purchasing. Should one fail, a new bell will be given by turning the broken one.

Orders may be sent through the AMERICAN ADVERTISING AGENCY, 389 Broadway, New York.

In case a Bell breaks after the expiration of the Warrantee, I allow HALF PRICE for the old metal. JOHN B. ROBINSON, 36 Dey Street, N. Y.

WEBSTER'S PATENT WRENCH,



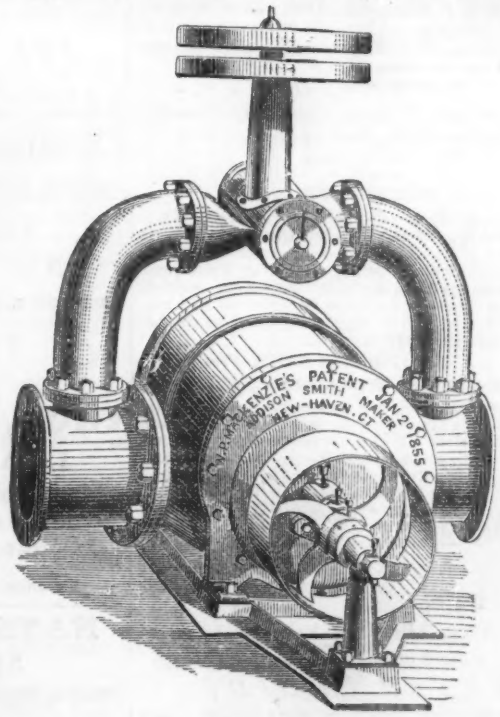
For Cutting Off & Screwing up Pipe, Round Rods, Bolts, Nuts, &c.

RECEIVED SPECIAL GOLD MEDAL FROM THE AMERICAN INSTITUTE
SEPTEMBER, 1865.

WEBSTER & CO.,
Sole Owners and Manufacturers, No. 17 Dey Street,
NEW YORK.

Smith & Sayre Manufactnring Company.

The Mackenzie Patent Gas Exhauster,
AND PATENT COMPENSATOR.



They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 ons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. fuel. Address

B. KREISCHER., Prest.
JAS. SAYRE, Treas,
CHAS. W. ISBELL, Sec'y. Office 484 Broadway, New York.

PERCE'S MAGNETIC GLOBES,

AND

PERCE'S MAGNETIC OBJECTS.

A beautiful Terrestial Globe, elegantly mounted and colored, and supplied with
MAGNETIC MEN,
MAGNETIC LADIES,
MAGNETIC SHIPS,
MAGNETIC STEAMERS,
MAGNETIC FLAGS,
MAGNETIC LIONS,
MAGNETIC BEARS,
MAGNETIC ELEPHANTS,
MAGNETIC LIGHTHOUSES,
etc., etc., forming a
MINIATURE MAGNETIC WORLD.

PERCE'S MAGNETIC GLOBE has won the warmest ecomiums from the press; from men of science, and from all lovers of the beautiful and useful in science, in art, wherever it has been seen. As an article of HOUSEHOLD FURNITURE, it is elegant and useful; "as useful," says the New York *Independent*, "for the entertainment and instruction of the little ones at home as the piano, or any other instrument for domestic amusement and instruction."

"PERCE'S MAGNETIC GLOBES AND MAGNETIC OBJECTS afford a wide field for many pleasing and surprising experiments; and with it, aided by the explanations which accompany it, our young readers will be able to conjure up many interesting illustrations and games which they will find profitable and amusing."

STYLES AND PRICES.

Perce's Magnetic Globe, 5 in. dia., Plain Stand,	$ 5
Perce's Magnetic Globe, 5 in. dia., Brass Meridian,	7
Perce's Magnetic Globe, 7 in. dia., Plain Stand,	10
Perce's Magnetic Globe, 7 in. dia., Brass Meridian,	25
Perce's Magnetic Globe, 12 in. dia., Plain Stand,	20
Perce's Magnetic Globe, 12 in. dia., Brass Meridian,	25

The Globes of all the above sizes and styles are finished in the highest style of the art, are mounted on polished black walnut stands, and will form an elegant and attractive ornament for the parlor, library or drawing-room.

One dozen of Perce's Magnetic Objects, with plainly written direbtions, accompany each globe without additional cost.

All Globes and Objects are packed neatly in boxes, and will be sent safely any distance by express, freight paid, on receipt of price.

CHARLES SCRIBNER & CO., Publishers,
151 No. 124 Grand-st., New-York.

GLYCERIN

For Wet Meters, Gasoline Machines, Hydraulic Presses, &c.

We warrant our Glycerine free from acid and not to corrode the Meter metal, or to congeal or freeze at a stated temperature—also, not to evaporate to any extent The advantages and savings derived from the use of our fluid can be testified by many Gas Light Companies which we have supplied. We only refer to the certificates of H. J. Miller, Esq., President of Cincinnati G. L. and Coke Co., and Dr. J. Lawrence Smith, Professor of Chemistry in the Louisville College, and President of the Louisville Gas Co.

HARTMAN & LAIST,

Office No. 41 East 2d street, Cincinnati,—Chemical Works on Providence street, and Miami Canal, near Findlay sreet.

CERTIFICATE.

Office Louisville Gas Co., Louisville, June 28, 1865.

This is to certify, that the Louisville Gas Co. have used for about two years, the Glycerine prepared by Messrs. Hartman & Laist of Cincinnati, in their Wet Meters, and have in all instances found it to give most perfect satisfaction. Prior to the use of the above Glycerin, we had employed that manufactured by other parties, and we consider H. & L.'s superior to any we used.

J. LAWRENCE SMITH, President.

Office Cincinnati Gas Light and Coke Co., July 7, 1865.

This will certify, that Messrs. Hartman & Laist of Cincinnati, furnished this Company with Glycerin for Wet Meters some two years since. It has proved very satisfactory, having resisted the action of frost during two winters and evaporating not more than six per cent. per annum, as guaranteed by them. The standard being, for density, 15 deg. Beaume's scale. They were the first to introduce it practically to this Company. H. J. MILLER, President.

☞L. BRUCKMANN, 67 Wall street,
Agent for New York.

H. P. GENGEMBRE'S

PATENT

Non Freezing and Non Evaporating METER FLUID,

☞ Far cheaper than any other in use. ☜

For Filling Wet Gas-Meters, cheaper, in the long run, than water.

Six years in general use in works using it, to the exclusion of all other fluid, and driving the dry meter out of use, enables us to recommend the patent with perfect confidence.

For information and purchase of rights, apply to
A. DOISEY, Esq., Sole Agent,
Box 2,180, Cincinnati, Ohio, or to
H. P. GENGEMBRE, Pittsburgh, Pa.

PLASTIC SLATE ROOFING

JOINT STOCK COMPANY.

OFFICE 157 [Room 19] BROADWAY,

New York.

W. C. POTTER, Vice Pres't.
J. M. ALLEN, Sec. and Treas. LICENSES GRANTED.

PLASTIC SLATE

FOR

ROOFING & OTHER PURPOSES.

The process of reconstructing Slate Stone from a disintegrated state was

PATENTED FEBRUARY 21st, 1865.

It is a combination of

Pulverized Slate & Viscous Matter,

(the latter possessing qualities of geological and chemical affinity for the former,) and is a development of one of the simple but unalterable tendencies of nature.

As a Roofing Material it Stands Unrivalled.

A mastic—it adapts itself to every shape and slope. Non-combustible, impervious, non-expansive, and undecaying.

Frost does not Crack nor Heat Dissolve it.

The only roofing material ever discovered that will resist the action of the elements as long as the structure it protects. Being susceptible of little, if any wear, from exposure, and

Perfectly Fire-Proof,

It is unequalled as a coating for Railroad and Farm Buildings, Fences, Bridges, bottoms of Vessels, Vaults, etc.

Edw'd Van Orden & Co.,

Manufacturers of Fire and Water-proof

Plastic Slate Roofing Materials,

ROOFING TOOLS, &C.

Office 41 Liberty-st.

Edw'd Van Orden. NEW YORK.
Jas. E. Dunn.

MILLS CONVENIENT FOR SHIPPING.

PARTZ & BUCK

MINING ENGINEERS, METALLURGISTS

AND

ANALYTICAL CHEMISTS,

57 BROADWAY,

A. F. W. PARTZ, } NEW YORK.
C. ELTON BUCK, }

CHAS. HOWDON SMITH,

BROKER IN MINING STOCKS

AND OTHER SECURITIES,

No. 5 1-2 PINE STREET,

ROOM NO. 5, NEW YORK.

T. CASSIDY & CO.,

(SUCCESSORS TO P. CASSIDY,)

Dealers in Old and New

IRON, COPPER, BRASS,

LEAD, SPELTER, &C.,

Corner of Bridge and John Streets,

BROOKLYN.

☞ N. B.—The highest cash price paid for the above named articles.

T. CASSIDY. 57-80 J. PEARCE.

NATIONAL FOUNDRY

AND PIPE WORKS.

Office and Works—Carroll, Piko, Smallman and Wilkins Streets,

PITTSBURGH, PA.

WM. SMITH,

Manufacturer of all kinds of GAS and WATER PIPE, BRANCHES, CONNECTIONS, T's, ELBOWS, and ALL CASTINGS USED AT GAS AND WATER WORKS.

I offer special inducements to parties wishing to purchase, my Pipe is Smooth, regular in weights, and cast vertically.

N. B.—Pipe from 3-inch and upwards, cast in 12-ft. lengths.

☞ SEND FOR CIRCULAR AND PRICE LIST. ☜
149

JOSEPH NASON & CO.,

No. 61 Beekman street, corner of Gold,

NEW YORK.

Manufacturers of WROUGHT IRON PIPES and Fittings for Steam, Gas and Water, Boiler Flues, Steam Boilers, Coils, Heaters, Evaporators, Pumps, Ventilating Machinery, and Apparatus for Warming Buildings by Steam and Hot Water.

OIL TUBING, CAST IRON DRIVING PIPE, Boring Tools, Oil Pumps, Sand Pumps, Stuffing Boxes, Tongs, Clamps, Swivels, Joints, &c. 131

BIRD, PERKINS & JOB,

(Formerly J. P. Melledge & Co.,)

General Commission Merchants,

And Importers of

PROVINCIAL COAL,

For Gas, Steam and Iron Manufactures.

39 India Wharf,..... ....Boston.

SAM'L T. BIRD, JAMES D. PERKINS, DANIEL W. JOB. [134

Represented in New York by GEORGE H. BREWER,
No. 104 Wall Street.

THE AUBIN BALANCED

VALVE WATER METER,

(Used also for Oils and Liquors)

IS NOW IN USE BY MANY CITY WATER Companies, because of its LOW PRICE, SIMPLICITY, DURABILITY, ACCURACY UNDER ANY PRESSURE, and, (a great advantage,) because it runs with less head than any other meter used.

Manufactured by

H. Q. HAWLEY,
Albany, N. Y.

Worthington's Steam Pump,

Extensively used by

GAS-LIGHT COMPANIES,

For sale at greatly reduced prices. Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.

☞ Patent GATES for Water and Steam-stops. ☜

HENRY R. WORTHINGTON,
161 61 Beekman-st, New York.

BRAYTON'S

Patent Steam Generator,

AND ENGINE.

A PERFECT SUCCESS. BY THIS INVENTION the long sought-for object has been accomplished; to wit: A means by which steam can be generated safely, so that there shall be no more danger from explosion than with the hot-air engine, and at the same time retain all the power of the steam engine. This much sought for result has at last been accomplished, and after many severe tests we feel fully warranted in offering this Steam Generator and Engine to the public as a perfectly safe power, and at the same time a cheap power. As a generator of steam for heating buildings, etc; there is not its equal in use. For further information or circular, address

R. A. HUTCHINSON,
159-182 Agent, No. 8 Dey-street, New York.

THE GOTHIC FURNACE,

FOR WARMING

HOUSES, STORES,

CHURCHES, &C.

Read the following testimonials.

"In every respect I find it meeting our wants, while it is economical in fuel, being SO SIMPLE OF CONSTRUCTION that it is EASILY CLEANED AND REGULATED. It has one great advantage over others in respect to the water pan; there is room for three pans if desired, while most furnaces have very little room for this MOST IMPORTANT article. I expect to build the coming season, and shall require two more of them. J. EDWARD IRELAND,
Mt. Vernon, N. Y."

"After a trial of three years I can safely affirm it to be the most desirable heat generator I have ever seen.
G. S. WEAVER, Albany.

"Your furnace has proved an entire success. Its heating properties, with the economy of fuel combined, surpass anything of the kind here. I have used it with bituminous as well as anthracite coal. G. CHURCH, Meadeville, Pa."

REFERENCES:

HENRY BALL, of Ball Black & Co; SIMEON LELAND; Rev. Dr. OSGOOD; ALFRED E. BEACH, of Scientific American; Hon. GEO. BANCROFT; Judge BULLOCK, U. S. District Court, Rhode Island, and hundreds of others.

Manufactured and for sale by

ALEX. M. LESLEY,
No. 605 Sixth Avenue, New York.

☞Old furnaces taken out and replaced with the Gothic. A circular sent on request.

T. B. BYNNER,

IMPORTER AND DEALER IN WATCHES AND JEWELRY, Agent for the AMERICAN WATCH. Also every variety of Swiss and English watches, AT THE LOWEST MARKET PRICES.

189 BROADWAY, NEW-YORK.

Oppsite John Street. 62-85

FOR SALE.

ONE SET 13-INCH HYDRAULIC MAINS FOR Five Benches of three retorts each, with Dip, Bridge and Stand Pipes and Mouth Pieces complete. Apply at the Office of the

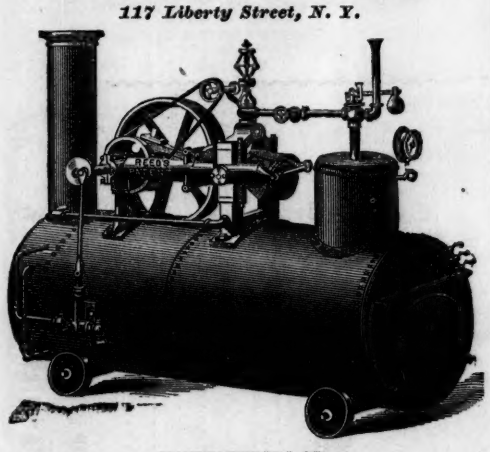
SALEM GAS-LIGHT CO.

62tf Salem, Mass.

REED & COGSWELL,

CONSULTING ENGINERES,

117 Liberty Street, N. Y.



MANUFACTURERS OF

Slide & Oscillating, Stationary & Portable

ENGINES,

Of all sizes. Also furnish all kinds of MACHINERY, TOOLS, AND GENERAL SUPPLY. Drawings of all kinds of Machinery executed to order.

JOHN A. REED. [63-86] W. B. COGSWELL.

JAS. O. SMITH & SONS,

MANUFACTURERS of LANTERNS,

81 FULTON, 55 GOLD, AND 90 ANN STREETS, N. Y.

We would especially direct attention to LATE IMPROVEMENTS in our No. 4 SMITH'S LANTERN, (for which we have applied for patent,) having a GLASS LAMP so constructed that the light passes through the bottom of the Lantern; also, the guards are so arranged as to dispense with soldering the top part of the guard to the trimming, obviating the difficulty that so frequently occurs in other lanterns of the guards melting off.

We are manufacturing at our factory, Middletown, Conn., MANY OTHER STYLES AND SIZES, which can be seen at our Show Rooms, 81 Fulton-st., New York. TRIMMINGS, etc., always on hand.

☞ The Trade are invited to call and examine our Stock.

EDDY'S

Kerosene Cooking & Heating

STOVES AND RANGES.

THESE COOKING STOVES WILL

☞ *Bake, Boil, Stew, Fry and Roast,*

With the greatest economy and facility, and without heating the room in which they are used. They are perfectly simple, operating like an ordinary Kerosene Lamp with a chimney, and are the only Kerosene Stoves that burn without smoke or odor.

"We have been perfectly astonished to see what a labor-saving, dirt saving and heat-saving institution is EDDY'S PATENT KEROSENE STOVE. Taking the cost of running it, and the result attained, it is the best patent in the market."—*Worcester Daily Spy.*

Our Heating and Cooking Stoves are very convenient and economical, especially where a fire is required but a few hours at a time.

Orders for Stoves may be sent through American Advertising Agency, 389 Broadway, New York.

ALEX. M. LESLEY,

Manufacturers, No. 605 Sixth Ave., New York.

Send for Illustrated Circular. (136

KNITTING MACHINES

FOR

Families and Manufacturers,

☞ *Something New and Invaluable for Family Use.*

We offer the public the simplest, strongest and best Knitting Machine in the world.

It occupies but little space—is portable and can be attached to a stand or table, weighs about 40 lbs.

It will knit a variety of Stitches—the breakage of needles is trifling—the cost of needles is insignificant and the most delicate material can be knit pure and spotless, as the needles are not oiled.

Orders for Machines may be sent through the American Advertising Agency, 389 Broadway, N. Y.

Send for a Circular—Agents wanted.

DALTON KNITTING MACHINE CO.,

137] 537 Broadway, N. Y.

WEED'S

HIGHEST PREMIUM

Shuttle Sewing Machine

Has only to be seen and operated to be Appreciated.

Call and see for yourself before purchasing. Please bring samples of various kinds of thread, (such as is usually found at stores,) and various kinds of fabric, which you know the former most popular Sewing Machines either cannot work at all, or, at best very imperfectly.

SUPERIORITY.

over any other Machine in the market will be seen at a glance.

1st It runs easily and rapidly, and is so constructed as to endure all kinds of hard usage.

2d. No breaking of threads in going over seams.

3d. No imperfect action of the feed at uneven places in the work.

4th. The Weed-stitch catches of itself, and will sew from the finest lace to the heaviest leather, and 200 cotton to coarse linen thread.

5th. The Weed Machine will do beautiful quilting on the bare wadding, without using inner lining; thus leaving it soft as if done by hand.

6th. The variety of fancy work that can be done on the

WEED MACHINE,

with so little trouble, makes it equal, if not superior, to six machines combined; for instance. it Binds, Hems, Tucks and Sews on the band at the same time, and in face, the

WEED NO. 2 MACHINE,

as before stated, is equivalent to a combination of any six ordinary machines.

Orders for Machines may be sent through the American Advertising Agency, 389 Broadway, N. Y.

Below we give a few prices:

No. 2. Oil Black Walnut, Ornamented with Hemmer.	$60,00
No. 2. Oil Black Walnut, Hall Case, Ornamented, with Hemmer.	65,00
No. 3. Extra Oil-Polished Black Walnut, Half Case, Large Table beautifully Ornamented.	75,00

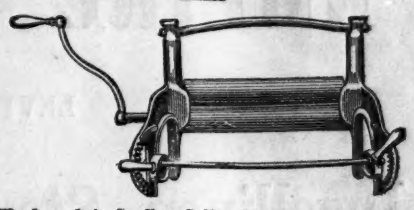
WEED SEWING MACAINE Co.,

136) 506 Broadway, New York

PUTNAM'S CLOTHES WRINGER.

IT IS THE ONLY RELIABLE

Self-Adjusting Wringer.



No Wood-work to Swell or Split. No Thumbscrews to get out of order. Warranted with or without Cog-wheels.

It took the First Premium at Fifty-seven State and County Fairs in 1863, and nearly double that number in 1864, and is, without an exception, the *best* Wringer ever made. Patented in the United States, England, Canada, and Australia. Agents wanted in every town, and in all parts of the world. Energetic agents can make from $3 to $10 per day.

WHAT EVERYBODY KNOWS, VIZ.:

That Iron well galvanized *will not rust.*

That a *simple* machine is better than a complicated one.

That a Wringer should be *self-adjusting, durable, and efficient.*

That thumb-screws and fastenings cause *delay* and *trouble* to regulate and keep in order.

That wood soaked in water will *swell, shrink,* and *split.*

That wood-bearings for the shaft to run in *will wear out.*

That the Putnam Wringer, with or without cog wheels, will *not tear the clothes.*

That cog-wheel regulators are not essential.

That the Putnam Wringer has *all* the advantages, and *not one* of the disadvantages above named.

That all who have tried it pronounce it the *best* Wringer ever made.

That it will wring a thread or a bed-quilt *without alteration.*

We might fill the paper with testimonials, but insert only a few to convince the skeptical, if such there be; and we say to all, *test* Putnam's Wringer. Test it *thoroughly* with *any* and any others, and if not entirely satisfactory, return it;

PUTNAM MANUFACTURING CO.—*Gentlemen:* I know from practical experience that iron well galvanized with zinc will not oxydize or rust one particle. The Putnam Wringer is as near perfect as possible, and I can cheerfully recommend it to be the best in use. Respectfully yours,

JOHN W. WHEELER, Cleveland, O.

Many years' experience in the galvanizing business enables me to indorse the above statement in *all particulars.*

JOHN C. LEFFERTS, No. 100 Beekman St.

NEW YORK, *January,* 1864.—We have tested Putnam's Clothes Wringer by practical working, and know that it will do. It is cheap; it is simple; it requires no room, whether at work or at rest; a child can operate it; it does its duty thoroughly; it saves time, and it saves wear and tear. We earnestly advise all who have *much* washing to do, with all intelligent persons who have *any,* to buy this Wringer. It will pay for itself in a year at most. HORACE GREELEY.

PRICES—$8, $9, and $10.

Sample Wringers sent, express paid, on receipt of price.

Manufactured and sold, wholesale and retail, by

PUTNAM MANUF'G CO.,

13 PLATT STREET, New York,

BENNINGTON, Vt.,

CLEVELAND O.

C. GEFRORER,

MANUFACTURER OF

Gas Heating Apparatus

OF EVERY DESCRIPTION,

Gas Burners, &c.

No. 529 COMMERCE STREET,

PHILADELPHIA, PA.

Burners for Wood, Coal Oil and Water Gas.

Gas and Lava Burner Tips

65 *Constantly on Hand.*

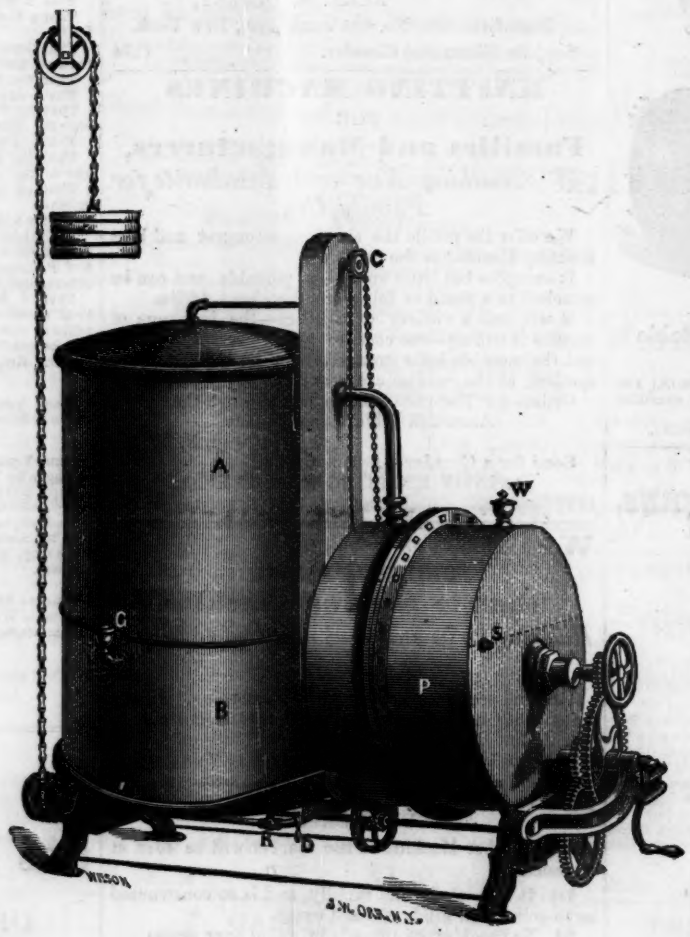
EMPIRE STATE GAS MACHINE,

LEVI STEVENS' PATENT, FOR SUPPLYING,

Dwellings. Stores, Factories and Public Buildings.

THE GAS GENERATED BY THIS MACHINE

Is a mixture of the vapor of hydro-carbon with common air. The mechanical devices employed are such as, from a long experience and critical examination into the nature of the element brought into use, seem best adapted to secure a certain and satisfactory result. GASOLINE, the liquid employed, is the more volatile portions of Petroleum, of a specific gravity of 0.6587. This liquid exposed to the action of this machine is vaporized, and a close mechanical mixture of the vapor with common air is effected. The value of the gas produced, its permanency, its illuminating quality, and freedom from liability to condensation, depend almost entirely upon the perfect and uniform character of this mixture. Hence the great importance of mechanical means adapted to secure all the conditions requisite in a Portable Gas Machine.



THE PRICE-LISTS OF MACHINES COMPLETE;

(Boxed and delivered on the cars at the Manufactory.)

No. 1,	$150,	5 Argand Burners.	
do. 2,	250,	do.	do.
do. 3,	350,	do.	do.
do. 4,	450,	do.	do.
do. 5,	600,	do.	do.
do. 6,	1,000,	do.	do.
do. 7,	1,500,	do.	do.

This machine will produce the most brilliant and steady light without Fire or Heat, and is warranted to operate in every respect as represented.

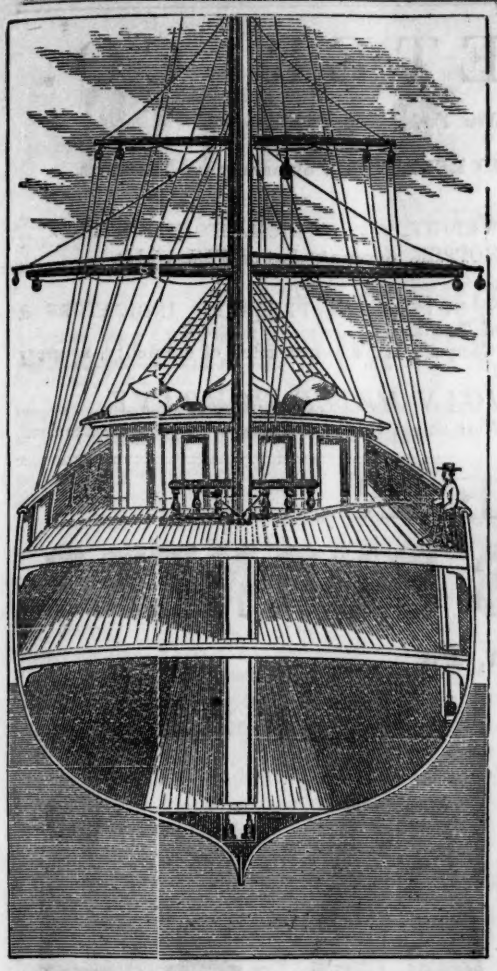
The EMPIRE STATE GAS MACHINE is the most SIMPLE and EFFECTIVE MEANS KNOWN FOR PRODUCING GAS WITHOUT HEAT.

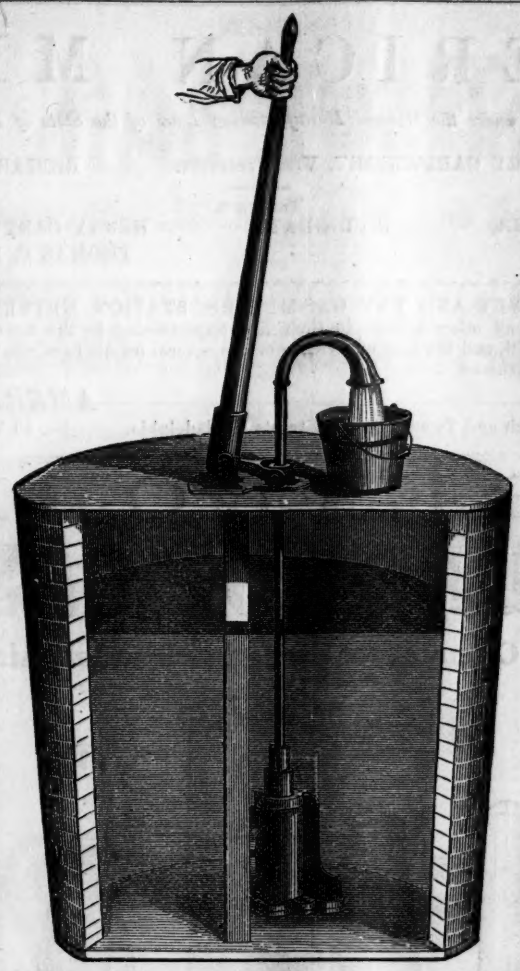
Its action is automatic, feeding itself with constant supplies of Gasoline, thus securing steady and uniform supplies of Gas. The gas produced is equal to the best known Illuminating Gas. It is as economical as any other, and is adapted to a wider range of use for Lighting, Heatin and Mechanical purposes. It will maintain its illuminating power under as great a degree of cold as any other. It is free from danger with the ordi nary care in using gas. Its remarkably pure and steady light is pleasant for the eye. It renders it easy for persons living remote from street gas pipes to enjoy the luxury of a pure GAS-LIGHT, at a COMPARATIVELY SMALL COST, AND WITH LITTLE TROUBLE.

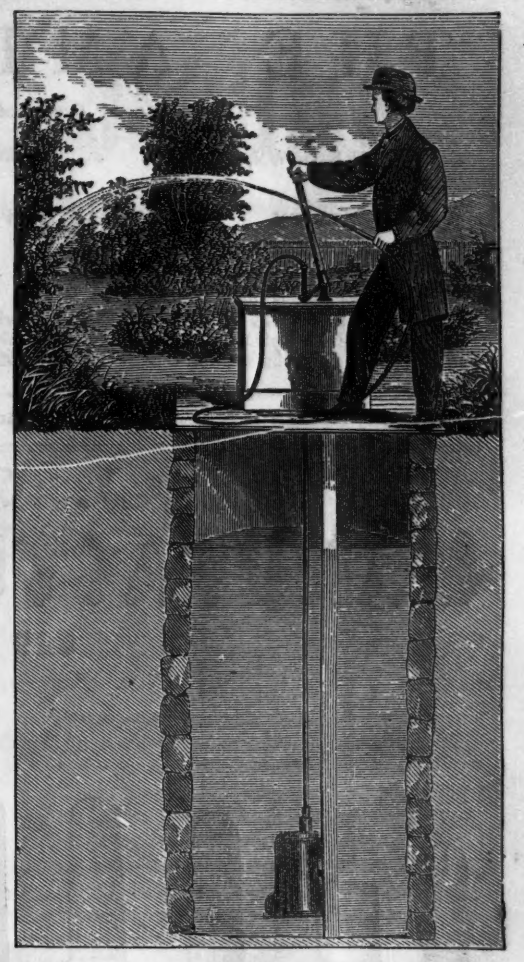
☞ The public are invited to witness its operations at our store. GASOLINE will be supplied by us, at market prices, or may be obtained from the various other sources of supply now going into operation.

MITCHELL, VANCE & Co., 620 Broadway, New York,

Manufacturers of Chandeliers and Gas Fixtures of every description. Also, Chandeliers, Brackets, Lamps, &c., for Coal Oil, adapted to Churches, Public Buildings, Dwellings, &c.







AMERICAN PUMP MANUFACTURING COMPANY,

DEPOT NO. 40 DEY STREET, NEW YORK.

A. B. VAN OLINDA, Secretary. C. V. B. OSTRANDER, Treasurer. E. BEADLESTON, President.

STATE AND COUNTY RIGHTS FOR SALE.

Pumps, completed, will be delivered from the manufactory of the Company, to parties purchasing rights at a royalty of One Dollar each.

THE PATENT SUBMERGED PUMP.

This valuable Invention, now first introduced, will, it is believed, supersede all classes for any purpose in use at the present time.

ITS ADVANTAGES.

First.—SIMPLICITY. The entire pump is composed of but six parts, all of cast-iron, which can be put together by any mechanic.

Second.—DURABILITY. From the fact that it is always submerged, it is perfectly lubricated, and requires no packing. As no water can remain in the pipe when not in motion, there is no danger of freezing.

Third.—CAPACITY. It is contended that, for the power applied, this Pump excels all others. The No. 1 (the smallest size,) of this Pump, with the power of one hand, has a capacity of thirty gallons per minute, and will throw a stream seventy feet in the air.

Fourth.—CHEAPNESS. For economy, this Pump surpasses all others, its first cost being about one-third less than that of other Pumps of the same capacity, and being much less both in size and weight, there is a great saving in transportation.

ITS USES.

First.—For a House Pump; the smallest size of the patent Submerged Pump is sufficient for all family purposes. Placed in a well or cistern, water may be conveyed to every room in a common sized house.

Second.—For a Farm Pump; for all purposes connected with irrigating, watering stock, etc., etc. This Pump can be placed in running streams, ponds, bayous, etc., and water conveyed to any required distance.

Third.—For a Ship Pump; Any ship owner or captain, with short experience in the use of this Pump, will give his unqualified approval for ship purposes, either to be used as a bilge pump simply, or for washing decks, etc. From its simplicity, as a bilge Pump it will be found entirely free from choking, and will clear grain, dirt, stones, etc., with ease.

Fourth.—For a Factory Pump, or for air in Oil Wells, for Breweries, or for pumping acids, hot liquors, etc., it is invaluable. It cannot be affected by any liquid.

Fifth.—To all Directors and Officers connected with mining interests, the PATENT SUBMERGED PUMP presents great advantages.

The experience of the last five years have clearly proved at what great expense, both in first cost and freight, it has been necessary to be at to secure the proper means of expelling water from the mines, quarries, etc. With this Pump an immense saving is effected in both instances, as in first cost it is much less than other Pumps of the same capacity and power.

Its principle is that of a Double-acting Force Pump, with a heavy double-acting piston cast in one piece, and a double-acting iron valve within the same, without the use of leather valves or any packing whatever.

DIRECTIONS FOR ADJUSTING PUMPS.

1st. Find the exact measurement of the well or cistern from the extreme bottom to the top or curb, after which make such an allowance as may be required, above the curb or top, as will accommodate the sized vessel required to be used, and in respect to the quantity of pipe required, always deducting for the length of the Pump and the space between the bottom and the Pump. 2d. Provide a plank, to which the Pump must be secured, not less than seven inches wide by two or two and a half inches thick, which should reach from the bottom to the top of the well or cistern, always placing the plank on the side of the well or cistern. 3d. Before putting the plank into a well or cistern, fit and bolt the Pump to the plank, and screw the pipe firmly in, taking care to have the Pump not less than one foot from the bottom of a well, nor less than six inches from the bottom of a cistern. Yet, if the water be six feet deep in a well, then adjust the Pump three feet from the bottom, and in like proportion as the case will permit, always being governed by the depth of water in the well, and always observing the necessity of securing the plank at the bottom of the curb, by braces across the well, and standing perfectly plumb and solid under the platform or covering of the well, when the fulcrum can be fastened to the platform, taking care to give the pipe free action when in motion.

THE AMERICAN METER CO.

Organized under the General Manufacturing Laws of the State of New York

SAMUEL DOWN, PRESIDENT. HENRY CARTWRIGHT, VICE PRESIDENT. RICHARD MERRIFIELD, SECRETARY AND TREASURER

TRUSTEES.

SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.
THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS & REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy and excellence of workmanship. Orders addressed

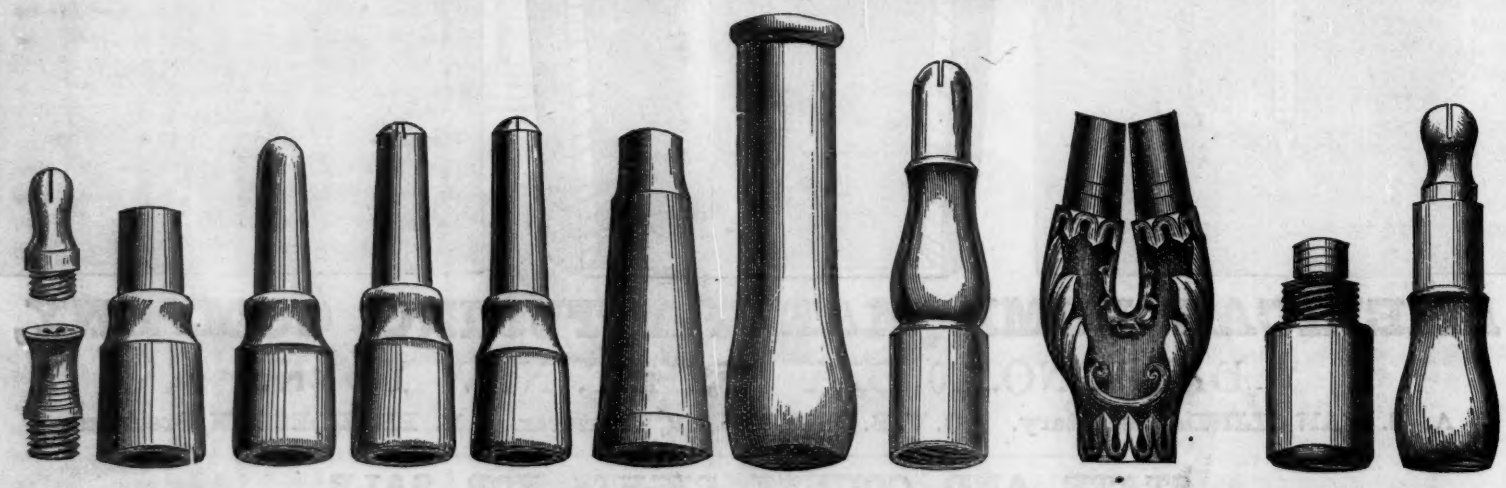
AMERICAN METER COMPANY,

West Twenty Second Street, New York. Arch and Twenty-Second Streets, Philadelphia. No. 23 West Street, Boston will meet with prompt attention.

C. GEFRORER,

MANUFACTURER OF GAS BURNERS,

529 Commerce Street, Philadelphia, Pa.



Burners for Wood, Coal Oil, and Water Gas. Brass and Lava Burner Tips Constantly on Hand.

GROVESTEIN & CO.,

PIANO FORTE MANUFACTURERS,

499 BROADWAY, NEW YORK.

THE ATTENTION of the public and the trade is invited to our New Scale, Seven Octave, Rosewood Piano-Fortes, which for volume and purity of tone are unrivalled by any that have hitherto offered in this market. They contain all the modern improvements, French Grand Action, Harp Pedal, Iron Frame, Over-strung Bass, etc., and each instrument, being made under the supervision of Mr. J. H. Grovesteen, who has had a practical experience of over thirty years in their manufacture, is fully warranted in every particular.

THE "GROVESTEEN PIANO-FORTE"
RECEIVED THE HIGHEST PREMIUM AT THE
CELEBRATED WORLD'S FAIR.

Where were exhibited instruments from the best makers of London, Paris, Germany, Philadelphia, Baltimore, Boston, and New York; and also at the American Institute for five successive years, the gold and silver medals from both of which can be seen at our warerooms.

By the introduction of improvement we make a still more perfect Piano-Forte, and by manufacturing largely, with a strictly cash system, are enabled to offer these instruments at a price which will preclude all competition.

PRICES.

No. 1,	Seven Octave, round corners, Rosewood,	Plain Case,	$275
No. 2,	" " "	Heavy Moulding	300
No. 3,	" " "	Louis XIV style	325

a fac-simile of the accompanying cut.

TERMS—Net Cash, in current funds. Descriptive circular sent free on application.